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Port of Seattle, Port of Tacoma, and The Northwest Seaport Alliance

ECONOMIC IMPACT ANALYSIS

Produced By: cai community attributes inc

March 2019

Community Attributes Inc. tells data-rich stories about communities that are important to decision makers.

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Port of Seattle, Port of Tacoma, and The Northwest Seaport Alliance

March 2019

ECONOMIC IMPACTS

The Northwest Seaport Alliance (2017)

$12.4 B
Total Business Output

58,400
Total Jobs

$4.0 B
Total Income

27.6 M
Metric Tons of Cargo Handled

3.7 M
Twenty-Foot Equivalent Units (TEUs)

146,900
Autos Transported

Port of Seattle Cruise Ship Industry (2019)

$893.6 M
Total Business Output

5,500
Total Jobs

1.2 M
Passengers, 2019

13%
Compound Annual Growth Rate of Passengers, 2000-2019

Port of Seattle Commercial Fishing (2017)

$1.4 B
Total Business Output

11,300
Total Jobs

300
Fishing Vessels Utilized Port of Seattle Facilities

1.3 M
Metric Tons Harvested by POS Customers in North Pacific Fisheries

Other Port of Seattle Activities Including Recreational Marinas (2017)

$1.6 B
Total Business Output

8,400
Total Jobs

4
Recreational Marinas

$2.6 M
Revenues Generated through Moorage

Other Port of Tacoma Activities (2017)

$1.6 B
Total Business Output

5,200
Total Jobs

$326.9 M
Total Income

2.3 M
Sq Ft of Warehouses, Offices, Industrial, and Other Buildings

Sources: Port of Seattle, 2018; Puget Sound Regional Council, 2018; Pacific Maritime Association, 2018; BNSF, 2018; Union Pacific, 2018; Washington Maritime Federation, 2018; The Northwest Seaport Alliance, 2018; Alaska Commercial Fishing Entry Commission, 2018; Washington State Office of Financial Management, 2018; Washington State Employment Security Department, 2018; Washington State Department of Revenue, 2018; Puget Sound Regional Council, 2019; Community Attributes Inc., 2019.

Port of Seattle

Port of Tacoma

THE NORTHWEST SEAPORT ALLIANCE

EXECUTIVE SUMMARY

The Ports of Seattle and Tacoma combined represent a core economic development asset for businesses and communities in Washington state and elsewhere in the U.S. Both ports facilitate the movement of millions of twenty-foot equivalent units (TEUs) of containerized cargo as well as millions of metric tons of breakbulk, automobiles, logs, and liquid bulk. Both ports are also host to industrial and non-industrial activities that spur job growth and economic wealth creation in the Central Puget Sound and Washington state. The Port of Seattle facilities support a large and growing cruise ship industry and serve approximately half of the North Pacific Fisheries Fleet.

Exhibit E1. Estimated Direct Impacts of Activities at The Northwest Seaport Alliance, Port of Seattle, and Port of Tacoma, Washington, 2017 and 2019

	Jobs	Business Output (mils)	Labor Income (mils)
The Northwest Seaport Alliance (2017)	20,100	$5,858.7	$1,902.7
Containerized Cargo	14,900	$4,537.6	$1,502.5
Automobiles	1,300	$308.8	$108.4
Breakbulk, Logs and Other Cargo	3,900	$1,012.2	$291.9
Port of Seattle Cruise Industry (2019, 2018$)	3,000	$467.8	$122.7
Port of Seattle Commercial Fishing (2017)	7,200	$671.3	$313.4
Port of Seattle Recreational Marinas and Other Business (2017)	3,600	$728.8	$357.2
Port of Tacoma Tenants and Other Business (2017)	1,500	$852.2	$114.3

Sources: Puget Sound Regional Council, 2019; Washington State Employment Security Department, 2018; Washington State Department of Revenue, 2018; The Northwest Seaport Alliance, 2018; Port of Seattle, 2018; Port of Tacoma, 2018; Community Attributes Inc., 2019.

Exhibit E2. Total Economic Impacts of Activities at The Northwest Seaport Alliance, Port of Seattle, and Port of Tacoma, Washington, 2017 and 2019

	Jobs	Business Output (mils)	Labor Income (mils)
The Northwest Seaport Alliance (2017)	58,400	$12,385.4	$4,018.5
Containerized Cargo	45,500	$9,722.6	$3,194.1
Automobiles	3,300	$643.4	$216.6
Breakbulk, Logs and Other Cargo	9,600	$2,019.4	$607.8
Port of Seattle Cruise Industry (2019, 2018$)	5,500	$893.6	$260.1
Port of Seattle Commercial Fishing (2017)	11,300	$1,438.0	$543.0
Port of Seattle Recreational Marinas and Other Business (2017)	8,800	$1,618.0	$642.0
Port of Tacoma Tenants and Other Business (2017)	8,400	$1,552.8	$616.5

Sources: Washington State Office of Financial Management, 2018; Community Attributes Inc., 2019.

The Northwest Seaport Alliance

The Northwest Seaport Alliance (NWSA) represents one of the largest marine cargo gateways in the U.S. In 2017, The Northwest Seaport Alliance handled more than 3.7 million twenty-foot equivalent units (TEUs) of containerized cargo. The majority of this cargo was international, though 700,000 TEUs were shipped to and from Alaska, Hawaii, and other domestic locations. In addition to containerized shipping, The Northwest Seaport Alliance also handles non-containerized cargo, including breakbulk, liquid bulk, automobiles, and logs. In total, nearly 27.6 million metric tons of cargo was handled at The Northwest Seaport Alliance facilities in 2017.

Within the NWSA, the largest driver of economic impact was containerized cargo. The NWSA containerized cargo facilities include six properties in the South Harbor and five in the North Harbor. In 2017, the NWSA handled more than 26.1 million metric tons of containerized cargo, directly supporting an estimated 14,900 jobs, $1.5 billion in labor income (including wages and monetized benefits), and $4.5 billion in business output. (**Exhibit E-1**)

In 2017, 146,900 automobiles were handled at the Port of Tacoma, totaling 224,900 metric tons of cargo. Automobile import activities directly supported 1,330 jobs in 2017, as well as more than $108.4 million in labor income and nearly $309 million in business output. (**Exhibit E-1**)

Breakbulk cargo transported through the NWSA include agriculture and mining equipment, military hardware, as well as other cargo that can be transported via roll-on/roll-off (RoRo) vessels. Breakbulk cargo totaled nearly 211,000 metric tons in 2017. The NWSA also handled nearly 53 million board feet of logs (278,100 metric tons), 715,500 metric tons of fuel, and nearly 36,000 metric tons of molasses in 2017. Breakbulk and other marine cargo handling directly supported 3,880 jobs in 2017, nearly $292 million in labor income and more than $1 billion in business output. (**Exhibit E-1**)

Combined across all marine cargo activities, the NWSA directly supported 20,100 jobs, and $1.9 billion in labor income in 2017. The average annual wage among direct jobs supported by marine cargo through the NWSA, including benefits, was nearly $95,000. In total, the NWSA marine cargo directly supported $5.9 billion in business output in 2017. (**Exhibit E-1**)

Factoring in upstream business-to-business transactions (indirect) and worker earned income household consumption expenditures (induced), the NWSA activities supported 58,400 jobs across the state economy, or the equivalent of a job multiplier of 2.9. In other words, for every direct job, marine cargo activities through the NWSA support an additional 1.9 jobs throughout the Washington state economy.

Cruise Ship Operations at the Port of Seattle

In 2019, the Port of Seattle will host 213 calls from ten different cruise lines and 18 ships. The industry in Seattle has grown from nearly 120,000 passengers in 2000 to an estimated 1.2 million in 2019 for a compound annual growth rate of 13%.

The cruise industry at the Port of Seattle is estimated to directly support nearly 3,000 jobs, with average annual wages including benefits of nearly $41,000. The total economic impact of cruise ships to the state economy in 2019, including direct, indirect, and induced impacts, is estimated at 5,500 jobs, $260.1 million in labor income, and $893.6 million in business output (**Exhibits E-1 and E-2**). The direct and secondary activities of cruise operations in 2019 are expected to generate $10.7 million in state sales and use taxes, and an additional $3.8 million in business and occupation taxes and other statewide taxes.

Port of Seattle Commercial Fishing

In 2017, more than 300 fishing vessels utilized Port of Seattle facilities. Of these, 226 were identified as actively fishing in Alaskan fisheries, based on the Alaska Commercial Fishing Entry Commission licensing data. In many cases, vessels that spend more time at other locations still depend on Port infrastructure for loading and offloading, on-dock repairs and maintenance, and provisioning. These include fish processors based in Lake Union that use the Port's facilities for loading and unloading infrastructure as well as vessels based in Alaska that periodically moor at the Port of Seattle for scheduled repairs.

Fishing vessels that moored at Port of Seattle facilities operating in the Alaskan fisheries generated gross earnings of more $455.0 million. An additional $26.6 million in revenues were earned in waters outside of Alaska, such as in the Puget Sound and Washington's west coast, based on ex-vessel wholesale value. Additional revenues were generated among various support services and on-shore Port of Seattle tenants and Port of Seattle services. Factoring in all segments of commercial fishing at the Port of Seattle, these activities generated more than $671.2 million in business output in 2017.

In 2017, an estimated 7,200 jobs were directly associated with commercial fishing at the Port of Seattle. These jobs supported labor compensation of $313.4 million. Overall, direct commercial fishing jobs associated with Port of Seattle facilities had an annual average wage, including benefits, of $43,500 in 2017, in part reflecting the seasonal nature of many commercial fishing jobs.

Factoring in indirect and induced impacts, the total statewide economic impact of commercial fishing operations summed to 11,300 jobs, $543.0 million in labor income, and more than $1.4 billion in business output in 2017 (**Exhibits E-1 and E-2**). Statewide fiscal impacts summed to $13.2 million.

Port of Seattle Recreational Marinas and Other Port Business

The Port of Seattle is home to an extensive portfolio of real estate assets and tenants, providing real estate for a wide variety of businesses outside of those that directly handle marine cargo included under The Northwest Seaport Alliance. The Port of Seattle is home to four recreational marinas: Shilshole Marina, Harbor Island Marina, Salmon Bay Marina, and Bell Harbor Marina. The Port also provides facilities and moorage for tugs and barges, as well as research vessels.

There were an estimated 200 jobs directly tied to recreational marinas, with an associated $13.9 million in labor income and $29.6 million in revenues. Other Port business directly supported an estimated 3,400 jobs, $343.3 million in labor income, and $699.2 million in business output. Recreational marinas and other Port business supported an average annual income of more than $99,200, including benefits. The total economic impact of Port of Seattle recreational marinas and other Port business, including indirect and induced impacts, summed to 8,800 jobs, $642.0 million in total compensation, and more than $1.6 billion in business output. (**Exhibits E-1 and E-2**)

Port of Tacoma Tenants and Other Business

The Port of Tacoma has more than 2,700 acres of real estate property. Many tenants on those properties directly support the marine cargo operations of The Northwest Seaport Alliance. However, the Port of Tacoma is home to a wide range of industrial and non-industrial tenants and activities. Outside of the NWSA marine cargo operations, the Port of Tacoma also provides bulk cargo operations at the TEMCO Grain Terminal, as well as bulk gypsum operations for the wallboard manufacturing activities of Georgia Pacific Gypsum.

In 2017, Port of Tacoma tenant and bulk activities summed to 1,500 direct jobs, $849.4 million in business output, and $109.8 million in labor income. Total economic impacts from these activities summed to 5,200 jobs, $326.9 million in labor compensation, and $1.6 billion in business output (**Exhibits E-1 and E-2**). Port of Tacoma tenant activities and other Port of Tacoma business supported an average annual income, including benefits, of more than $76,000. These activities supported $15.4 million in state taxes through direct and secondary activities.

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INTRODUCTION

Background and Purpose

The Ports of Seattle and Tacoma combined represent a core economic development asset for businesses and communities both in Washington state and elsewhere in the U.S. The Northwest Seaport Alliance is one of the largest marine cargo gateways in the U.S. In 2017, nearly 27.6 million metric tons of cargo were handled by the NWSA at the Ports of Seattle and Tacoma. The majority of the 3.7 million TEUs of container cargo shipped through the NWSA were international, though 700,000 TEUs were shipped to and from Alaska, Hawaii, and other domestic locations. Both ports are also host to industrial activities that spur job growth and economic wealth creation in the Central Puget Sound and Washington state. The Ports of Tacoma and Seattle provide industrial land for manufacturing, warehousing, energy and resource activities, and more. Port of Seattle facilities are key assets for approximately half of the North Pacific Fisheries Fleet and support the large and growing cruise ship industry.

This report provides a comprehensive evaluation of the economic impacts of these varied activities directly tied to port operations, broken out by the following:

- **The Northwest Seaport Alliance**. Representing containerized cargo, auto imports, breakbulk, and bulk shipments across the Ports of Seattle and Tacoma.
- **Other Port of Seattle Activities and Tenants**. Including commercial fishing, recreational marinas, cruise ships, and other tenants at the Port of Seattle.
- **Other Port of Tacoma Activities and Tenants**. Including grain and gypsum cargo operations, port-based manufacturers, non-industrial tenants, and other non-NWSA activities resident at the Port of Tacoma.

Analytics include estimated direct activities—measured in jobs, income, and business output—directly supported by the above activities and associated nearby services directly tied to port operations (such as off-site transloading) and the broader economic and fiscal impacts of these activities to the state economy.

Data and Methods

Data used in this report draw from several sources, including state and federal employment and wage files maintained by the Washington State Employment Security Department, Puget Sound Regional Council, and U.S. Bureau of Labor Statistics; gross business income published by the Washington State Department of Revenue; cargo and trade statistics

published by the U.S. Census Bureau and provided by the Ports of Tacoma and Seattle and The Northwest Seaport Alliance; and other relevant information maintained and provided by the Ports of Tacoma and Seattle and The Northwest Seaport Alliance. Direct activities were further modeled to account for missing information when necessary.

Economic impacts include additional jobs, income, and business output supported through upstream business-to-business transactions (indirect impacts) and household consumption expenditures (induced impacts). Fiscal impacts include state tax revenues derived from direct port-related activities, and through multiplier effects among other industries and regions of the state.

Organization of Report

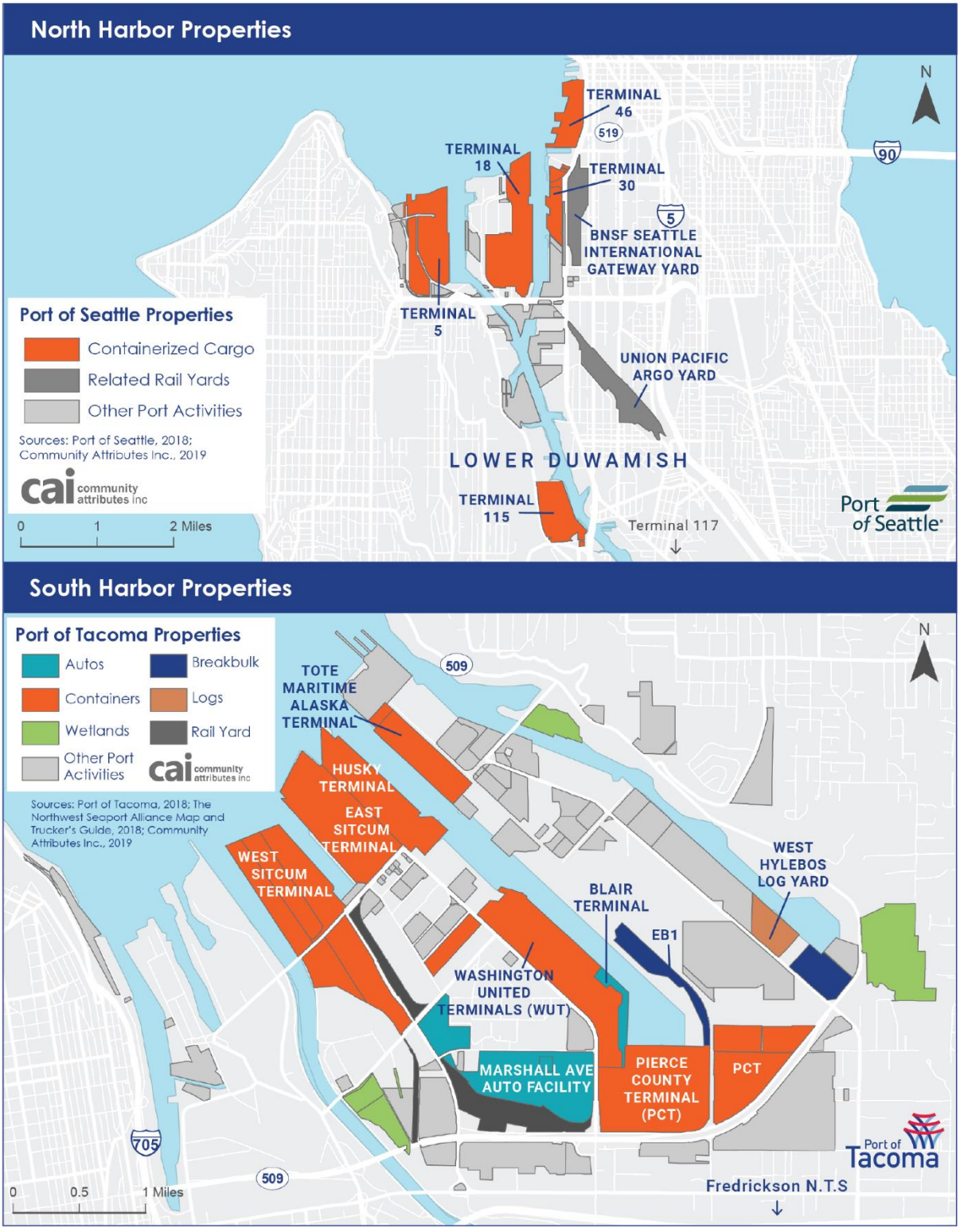
The remainder of this report is organized as follows:

- **The Northwest Seaport Alliance, Port of Seattle, and Port of Tacoma Marine Cargo Activities.** Review of key indicators, facilities, and direct and total impacts for containerized cargo managed by The Northwest Seaport Alliance. Summary of indicators and activities for auto shipping and a review of activities and indicators for breakbulk cargo, logs and lumber, and other cargo managed by The Northwest Seaport Alliance.
- **Port of Seattle Cruise Ship Industry.** Summary of projected cruise ship activities at the Port of Seattle, including homeported vessels, port of calls, passenger spending onshore, vessel and crew provisioning and payroll, and economic and fiscal impacts.
- **Port of Seattle Commercial Fishing**. Size, breadth, and impacts of commercial fishing operations tied to Port of Seattle facilities, including vessels active in the North Pacific Fisheries.
- **Port of Seattle Recreational Marinas and Other Businesses**. Port of Seattle's recreational marinas, associated marina expenses and facilities, as well as the impacts of other port businesses, such as industrial and retail tenants on Port of Seattle properties.
- **Port of Tacoma Tenants and Other Business.** Includes a review of facilities and direct and total impacts for the tenants on Port of Tacoma properties, including both industrial and non-industrial users.
- **Summary and Conclusions.** Summary of key findings.

The Northwest Seaport Alliance

MARINE CARGO

The Northwest Seaport Alliance, the fourth-largest container gateway in North America, is a marine cargo operating partnership between the Ports of Seattle and Tacoma. The Alliance's containerized cargo operations support jobs, labor income and business output across the state of Washington.



Organization of this Section

This section provides a detailed, data-rich discussion of the economic contributions of The Northwest Seaport Alliance (NWSA) marine cargo activities, including ongoing operations, the NWSA's role as a gateway for domestic and international trade, and economic and fiscal impacts. The Northwest Seaport Alliance has multiple lines of business. Each is examined in detail.

Findings are organized as follows:

- **Overview of The Northwest Seaport Alliance Facilities and Activities**. A discussion of operations, assets, and overall trade trends.
- **Containerized Cargo Activities**. Leading merchandise and commodity exports and imports by volume and value and economic impacts associated with the handling of this cargo, including jobs, labor income, and business output through the NWSA.
- **Automobile Imports**. The economic value and impacts associated with the handling of automobile imports through the NWSA, including the many jobs and activities involved in the movement of vehicles off roll-on/roll-off vessels to warehousing facilities and vehicle finishing activities.
- **Breakbulk, Logs, and Other Non-Containerized Cargo**. The economic value and impacts associated with the handling of various other types of marine cargo through the NWSA.
- **Summary of NWSA Marine Cargo Impacts**. A summation of impacts across all lines of business for 2017.
- **Fiscal Impacts from NWSA Marine Cargo Activities**. State taxes supported through both direct operations of the NWSA and additional tax revenues through indirect and induced taxable activities across the state economy.

Overview of The Northwest Seaport Alliance Facilities and Activities

The Northwest Seaport Alliance (NWSA) is a marine cargo operating partnership created in 2014 between the Port of Seattle (North Harbor) and Port of Tacoma (South Harbor). The NWSA, as a combined entity, represents the fourth-largest container gateway in North America. The NWSA manages the majority of marine cargo facilities across both ports, including all containerized cargo operations, breakbulk, automobiles, project/heavy-lift cargoes, and some bulk operations.

The North Harbor has five container terminals, of which four are in use. Terminal 5 is currently vacant (**Exhibit 1**). There are a variety of properties that provide supporting activities to the containerized cargo terminals. The BNSF Seattle International Gateway Yard and the Union Pacific Argo Yard provide essential rail services for containerized cargo activities. Terminal 106, south of Harbor Island and on the east side of the Duwamish River, is used as a container support yard. Terminals 107 (west side of the Duwamish) and Terminal 108 (east side of the Duwamish), just north of Terminal 115, offer moorage for barges.

The South Harbor has six container terminals, as well as Blair Terminal where automobiles are offloaded (**Exhibit 1**). East Blair 1 (EB1) provides services for roll-on/roll-off (RoRo) vessels and the West Hylebos Log Yard provides services for log exports. Terminal 7, on the south end of East Sitcum Terminal, also provides automobile and RoRo services.

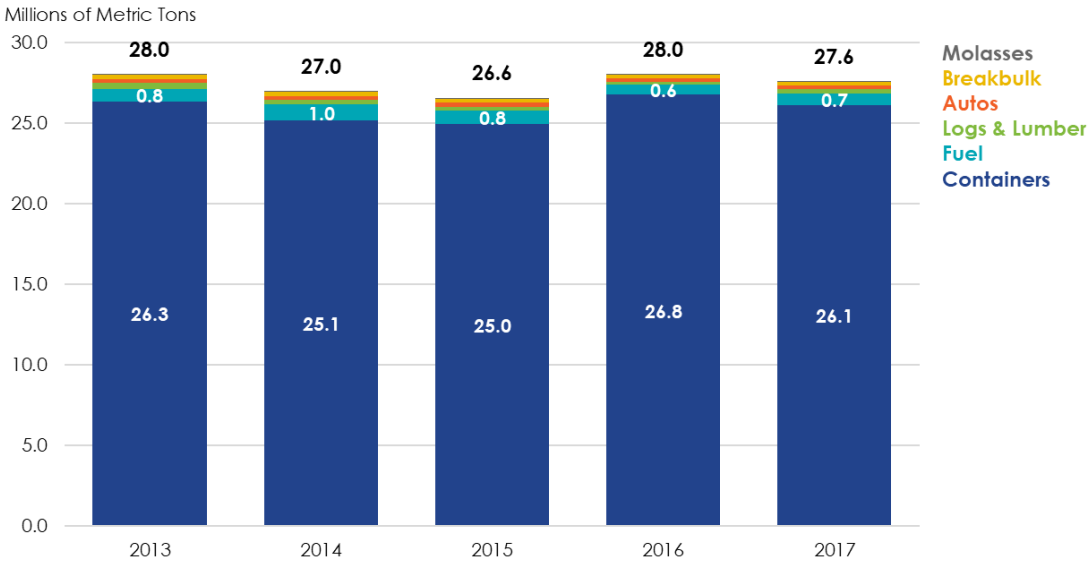
Exhibit 1. Containerized Cargo Terminals, The Northwest Seaport Alliance

Terminal	Harbor	Operator
East Sitcum Terminal	South	Ports America
Husky Terminal	South	Husky Terminal and Stevedoring, Inc.
Pierce County Terminal	South	Everport Terminal Services Inc.
TOTE Maritime Alaska Terminal	South	TOTE Maritime
Washington United Terminals (WUT)	South	Washington United Terminals
West Sitcum Terminal (Formerly APM Terminals)	South	SSA Marine
Terminal 115	North	Alaska Marine Lines
Terminal 18	North	SSA Marine
Terminal 30	North	SSA Marine
Terminal 46	North	Total Terminals International
Terminal 5	North	*Currently vacant*

Sources: The Northwest Seaport Alliance, 2018; Community Attributes, Inc., 2019.

In total, The Northwest Seaport Alliance had nearly 1,950 vessel calls in 2017. The NWSA handled nearly 27.6 million metric tons of cargo, of which nearly 95% was containerized cargo. In 2017, the NWSA handled more than 3.7 million TEUs. Other marine cargo handled at the North and South Harbors include breakbulk, automobiles, fuel, and molasses. (**Exhibit 2**)

Exhibit 2. The Northwest Seaport Alliance Marine Cargo by Type, 2013-2017



Sources: The Northwest Seaport Alliance, 2018; Community Attributes, Inc., 2019.

Containerized Cargo Activities

In this report, activities included under "containerized cargo activities" include all operations, services, and facilities related to the handling of 20, 40, and 45-foot ocean cargo containers, either outbound or inbound. The activities span container terminal facilities in both the ports of Seattle and Tacoma, under the auspices of The Northwest Seaport Alliance.

Containerized Cargo Trends

Today, The Northwest Seaport Alliance manages most of the marine cargo activities at both the Ports of Seattle and Tacoma and provides a strategic partnership to work together to strengthen the gateway and attract more marine cargo business.[1] Together, as The Northwest Seaport Alliance, the Ports of Seattle and Tacoma represent the fourth-largest container gateway in North America.

[1] The NWSA does not manage the grain terminals at either Port.

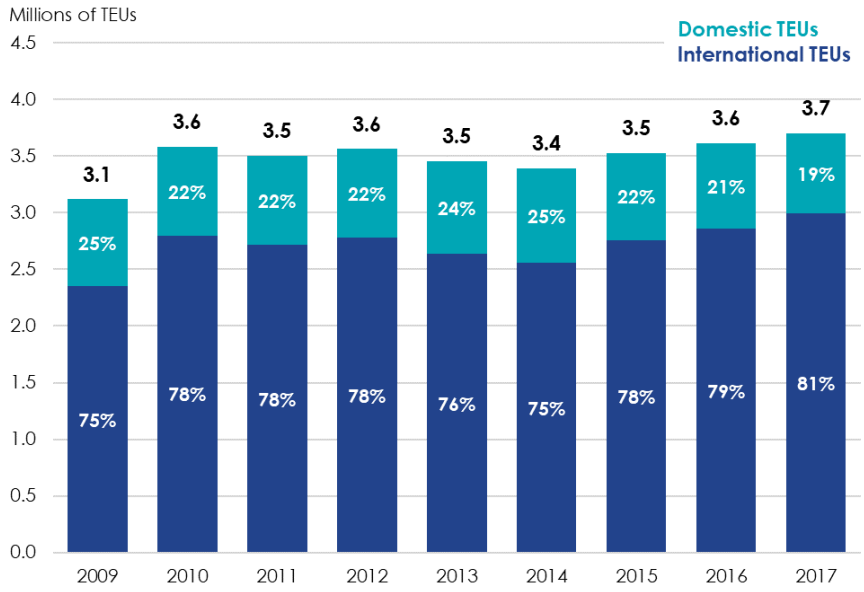
Containerized cargo represents 95% of all cargo tonnage handled through The Northwest Seaport Alliance. In 2017, 3.7 million TEUs passed through the North and South Harbors (**Exhibit 3**). International imports represent nearly 41% of all TEUs, while exports represent 40%; domestic container cargo accounted for the remaining 19%. While full containers represent more than 75% of all TEUs handled, empty containers are also an important part of activities at the NWSA. Both full and empty containers are loaded and off-loaded from vessels, requiring the expertise of a wide-range of industries and occupations, including terminal operators, longshore workers, truckers, and more. Full and empty containers both are considered in the estimation of economic and fiscal impacts generated by containerized cargo handled through The Northwest Seaport Alliance. Total TEUs through the NWSA increased from 3.4 million in 2014 to 3.7 million in 2017 (**Exhibit 4**).

Exhibit 3. Containerized Cargo Volumes, Full and Empty TEUs by Type, The NWSA, 2017

	Full	Empty	Total
Imports	1,380,785	132,222	1,513,007
Exports	964,067	518,237	1,482,305
Domestic	447,440	259,423	706,863
Total	**2,792,292**	**909,882**	**3,702,174**

Sources: The Northwest Seaport Alliance, 2018; Community Attributes, Inc., 2019.

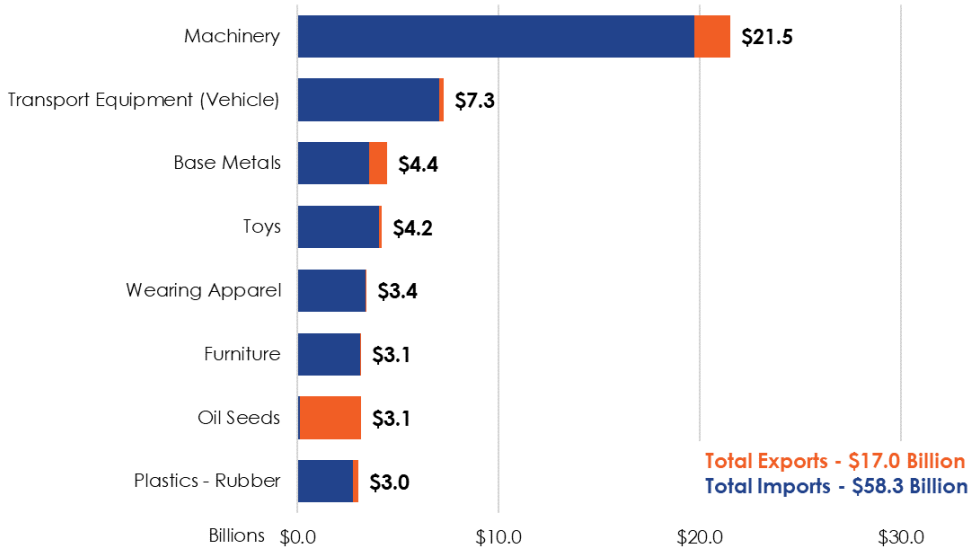
Exhibit 4. Containerized Cargo Volumes, The NWSA, 2009-2017



Sources: PIERS, 2018; Community Attributes, Inc., 2019.

In 2017, the total vessel value of containerized cargo through the NWSA was nearly $75.3 billion, with machinery accounting for approximately 29%. Vessel value is the technical term for the value of commodities within ocean containers. Imports represented 77% of total vessel value, or $58.3 billion, and exports totaled nearly $17.0 billion. Other leading commodities in 2017 were transport equipment, base metals, toys, and apparel, each representing more than 5% of total vessel value. (**Exhibit 5**)

Exhibit 5. Containerized Cargo Commodities Each Representing More than Four Percent of Total Vessel Value, The NWSA, 2017

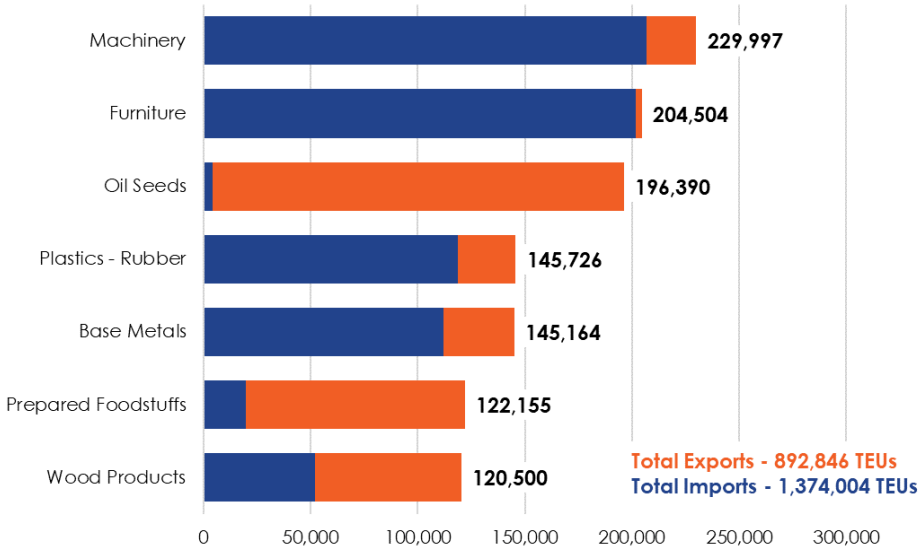


Sources: WISER, 2018; Community Attributes, Inc., 2019.

Machinery represents 10% of total TEUs and 29% of total vessel value. Hay, one of several commodities in the "Oil Seed" commodity grouping,[2] was the leading export handled through the NWSA, represent 4% of total vessel value, but nearly 9% of total TEUs. (**Exhibit 6**)

[2] The full name of this harmonized system (HS) code category is "Oil Seeds and Oleaginous Fruits; Miscellaneous Grains, Seeds and Fruit, Industrial Medicinal Plants; Straw and Fodder."

Exhibit 6. Containerized Cargo Commodities Each Representing More than Five Percent of Total TEUs, The NWSA, 2017 (TEUs)



Sources: PIERS, 2018; Community Attributes, Inc., 2019.

Products shipped via container require various services rendered either inbound or outbound through the NWSA, such as transportation logistics. The services required depend on the type of products shipped, distance from the NWSA facilities, among other factors. Leading import commodities include machinery, furniture, rubber plastics, base metals, and transport equipment. Leading export commodities include oil seeds/hay, prepared foodstuffs, wood pulp, and wood products. (**Exhibit 7**)

Exhibit 7. Containerized Cargo Imports and Exports by Commodity, TEUs, The NWSA, 2017

	Import TEUs	Export TEUs	Total TEUs
Machinery	206,837	23,160	229,997
Furniture	201,767	2,737	204,504
Oil Seeds	4,177	192,213	196,390
Plastics - Rubber	118,639	27,087	145,726
Base Metals	111,863	33,301	145,164
Prepared Foodstuffs	19,961	102,194	122,155
Wood Products	51,934	68,566	120,500
Transport Equipment (Vehicle)	104,580	6,616	111,196
Toys	90,755	7,004	97,759
Wood Pulp	4,071	84,068	88,139
Vegetables	2,915	55,193	58,108
Other	456,505	290,707	747,212
Total	**1,374,004**	**892,846**	**2,266,850**

Sources: PIERS, 2018; Community Attributes, Inc., 2019.

In 2017, containerized cargo was either imported or exported to 166 countries through The Northwest Seaport Alliance. The countries with the most containerized cargo moving through the NWSA include China, Japan, South Korea, Taiwan, Vietnam, and Hong Kong, which together represent more than 80% of all TEUs transported via the NWSA in 2017. Among countries with TEUs representing more than 2% of the total, TEU volume imported from and exported to Vietnam increased at a compound annual growth rate of 6% between 2013 and 2017. (**Exhibit 8**)

Exhibit 8. Containerized Cargo Imports and Exports by Country, TEUs, The NWSA, 2017

	Import TEUs	Export TEUs	Total TEUs
China	832,890	219,106	1,051,996
Japan	110,306	178,877	289,183
Korea	61,884	145,660	207,544
Taiwan	63,976	77,233	141,209
Vietnam	56,288	13,881	70,169
Hong Kong	23,463	32,047	55,510
Thailand	27,975	15,051	43,026
Indonesia	22,474	19,188	41,662
India	16,258	20,030	36,288
Malaysia	19,083	13,806	32,889
Philippines	8,610	18,017	26,627
Australia	3,488	16,963	20,451
Other	127,309	122,987	250,296
Total	**1,374,004**	**892,846**	**2,266,850**

Sources: PIERS, 2018; Community Attributes, Inc., 2019.

Economic Impacts

Direct activities associated with the movement of ocean cargo containers, both full and empty, include on-site stevedoring operations; drayage; rail operations; tug assists for container cargo vessels; barges that convey containerized cargo to domestic ports in Alaska and Hawaii; off-site transloading facilities; warehousing and distribution centers; non-drayage trucking; local and federal government personnel supporting or regulating containerized cargo; and various support services.

Containerized cargo activities directly supported 14,900 jobs in 2017. The average annual income, including benefits, across all direct jobs supported by containerized cargo activities in 2017, was more than $100,800. The largest source of employment was trucking, logistics, and warehousing, representing drayage, short- and long-haul trucking, transloading, and warehousing and distribution operations (8,510). Many firms operate across each of these areas, such as large transloading and logistics companies that retain their

own truck fleets, operate their own warehouses and distribution centers and provide logistics support for incoming and outgoing cargo.

Terminal operations include administrative and back-office staff, on-site stevedoring personnel, and longshoremen, and supported 3,550 jobs in containerized cargo in 2017 across both harbors. An estimated 1,290 workers in the rail industry were supported through containerized cargo shipments, including at rail switching yards, maintenance facilities, and back office planning across Washington. Additional services supporting the movement of containerized cargo through The Northwest Seaport Alliance include the transport of containerized cargo on barges; maritime support services such as maritime insurance and law; and navigational services including tug assists and pilots. (**Exhibit 9**)

Exhibit 9. Estimated Direct Impacts of Containerized Cargo Activities by Economic Activity, Washington, 2017

Activity	Jobs	Business Output (mils 2017 $)	Labor Income (mils 2017 $)
Truck Transportation, Logistics & Warehousing	8,510	$2,328.8	$813.4
Terminal Operations, Stevedoring, and Longshoremen	3,550	$1,163.1	$409.6
Rail Transportation	1,290	$660.9	$105.1
Government	530	$194.0	$62.7
Barge and Tug Transport	400	$61.3	$45.3
Maritime Support Services	350	$51.3	$33.0
Navigational Services	260	$78.2	$33.4
Total	**14,890**	**$4,537.6**	**$1,502.5**

Sources: Port of Seattle, 2018; Puget Sound Regional Council, 2018; Pacific Maritime Association, 2018; BNSF, 2018; Union Pacific, 2018; Washington Maritime Federation, 2018; Washington State Department of Revenue, 2018; Washington State Employment Security Department, 2018; Community Attributes Inc., 2019.

Factoring in indirect and induced economic impacts, containerized cargo operations supported a total of 45,500 jobs, $3.2 billion in labor income, and $9.7 billion in business output in 2017. Containerized cargo shipping through the NWSA supports 1.2 jobs per 100 TEUs and more than $2,620 in total business output per TEU. (**Exhibit 10**)

Exhibit 10. Economic Impacts from Containerized Cargo Shipping through The Northwest Seaport Alliance, Washington, 2017

	Direct	Indirect	Induced	Total
Jobs	14,900	11,900	18,700	45,500
Total Compensation (mils 2017 $)	$1,502.5	$703.1	$988.6	$3,194.1
Business Output (mils 2017 $)	$4,537.6	$2,267.7	$2,917.3	$9,722.6

Sources: Washington State Office of Financial Management, 2018; Community Attributes Inc., 2019.

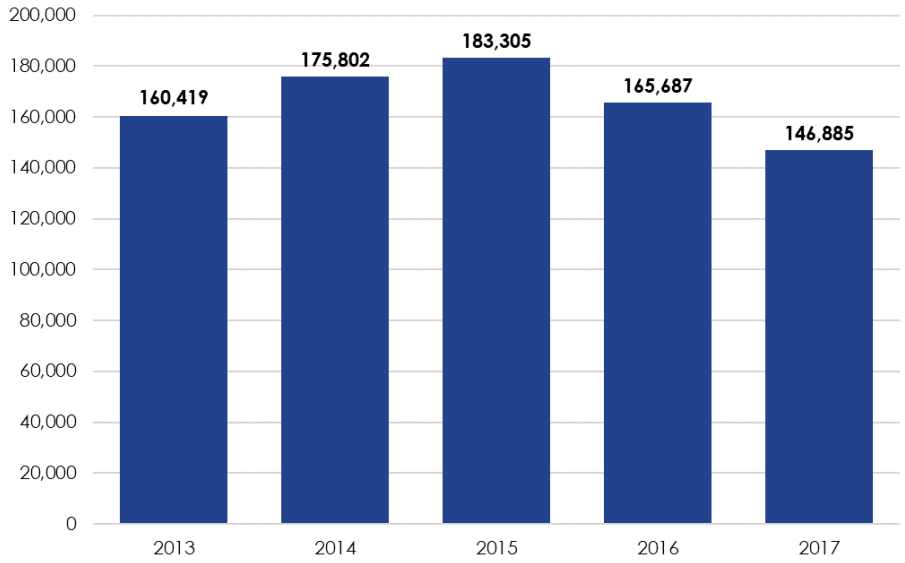
Automobile Imports

The Northwest Seaport Alliance also handles automobile imports. In 2017, 146,900 automobiles were handled at the Port of Tacoma, totaling 224,900 metric tons of cargo (**Exhibit 11**). Automobiles are offloaded at the Blair Terminal, Terminal 7 and East Blair One at the South Harbor. With its headquarters at the Marshall Avenue Auto Facility in Tacoma, Auto Warehousing (AWC) provides a variety of vehicle processing services, including logistics and accessory installation, to support auto imports at The Northwest Seaport Alliance. Customers served by AWC include Kia, Mazda, BMW, Mitsubishi, Isuzu, and Fuso Trucks.

In early 2018, the Port of Tacoma announced a 30-year lease with Wallenius Wilhelmsen Logistics for the development of a new auto processing facility. This new facility will not only expand auto import facilities at the Port of Tacoma and for The Northwest Seaport Alliance, but also expands the marine cargo business of WWL with The Northwest Seaport Alliance. Currently, WWL transports roll-on/roll-off cargo through the NWSA. The new operation is expected to create 100 new jobs and process in excess of 100,000 auto units per year.[3]

[3] Port of Tacoma, 2018, https://www.portoftacoma.com/news-releases/2018-02-14/port-tacoma-leases-former-kaiser-site-wwl-auto-processing-facility.

Exhibit 11. Automobile Units, The Northwest Seaport Alliance, 2013-2017



Sources: The Northwest Seaport Alliance, 2018; Community Attributes, Inc., 2019.

Direct activities supported by the movement of automobiles at the Port of Tacoma include on-site stevedoring operations; trucking; auto accessory installation services; tug assists for car carriers; rail operations; local and federal government personnel supporting or regulating automobile imports; and various supporting services.

Automobile import activities directly supported 1,330 jobs in 2017. The average annual income, including benefits, across all direct jobs supported by automobile import activities in 2017 was nearly $83,400. Trucking, logistics, and warehousing, including both short- and long-haul trucking, was the largest source of employment, with 480 direct jobs. Terminal operations includes the activities of Auto Warehousing, providing both logistics and accessory installation services, as well as on-site stevedoring personnel and longshoremen, totaling 380 jobs supported by automobile imports through the NWSA in 2017. Additional services supporting the movement of automobiles through the NWSA include rail transportation; maritime support services such as maritime insurance and law; navigational services including tug assists and pilots; and government personnel overseeing the movement of automobiles through the NWSA. (**Exhibit 12**)

Exhibit 12. Estimated Direct Impacts of Automobile Imports by Economic Activity, Washington, 2017

Activity	Jobs	Business Output (mils 2017 $)	Labor Income (mils 2017 $)
Truck Transportation, Logistics & Warehousing	480	$131.5	$45.9
Terminal Operations, Stevedoring, and Longshoremen	380	$43.5	$17.5
Rail Transportation	150	$76.2	$12.1
Maritime Support Services	140	$20.9	$13.4
Navigational Services	110	$32.5	$13.9
Government	70	$4.3	$5.5
Total	**1,330**	**$308.8**	**$108.4**

Sources: Port of Seattle, 2018; Puget Sound Regional Council, 2018; Pacific Maritime Association, 2018; BNSF, 2018; Union Pacific, 2018; Washington Maritime Federation, 2018; Washington State Department of Revenue, 2018; Washington State Employment Security Department, 2018; Community Attributes Inc., 2019.

The total economic impact of automobiles handled through the NWSA in Washington is more than $643 billion in business output in 2017, composed of direct ($308.8 million), indirect ($136.8 million), and induced ($197.8 million) impacts. Automobile shipping supported 3,300 total jobs in the state and nearly $217 million in labor income including wages and benefits. (**Exhibit 13**)

Exhibit 13. Economic Impacts of Automobile Shipping through The Northwest Seaport Alliance, Washington, 2017

	Direct	Indirect	Induced	Total
Jobs	1,300	700	1,300	3,300
Total Compensation (mils 2017 $)	$108.4	$41.2	$67.0	$216.6
Business Output (mils 2017 $)	$308.8	$136.8	$197.8	$643.4

Sources: Washington State Office of Financial Management, 2018; Community Attributes Inc., 2019.

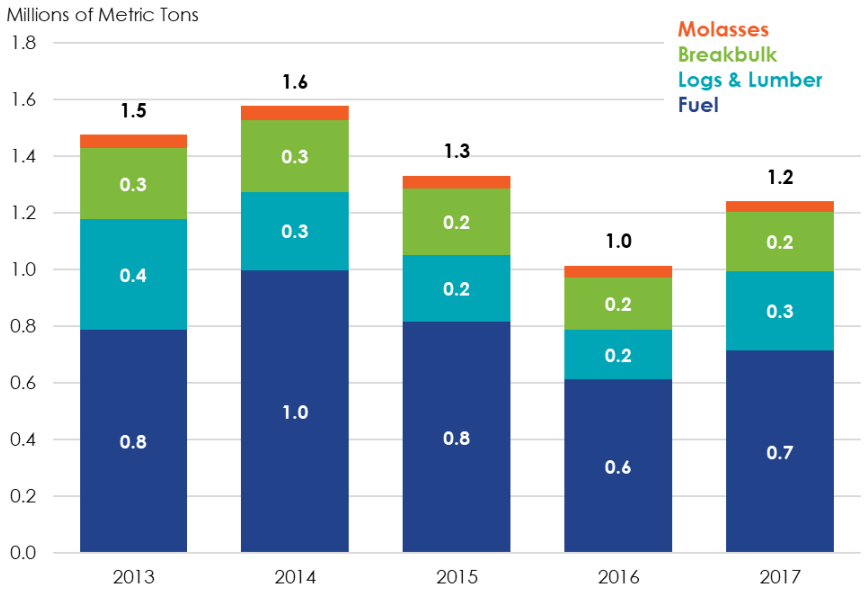
Breakbulk, Logs, and Other Non-Containerized Marine Cargo

The Northwest Seaport Alliance manages the flow of a wide variety of marine cargo beyond containerized cargo and automobiles. In total, containers represented nearly 95% of total metric tons of cargo handled by the NWSA. Other marine cargo includes breakbulk, logs, fuel, and molasses. Breakbulk cargo transported through the NWSA includes agriculture and mining equipment, military vehicles and other cargo that can be transported via roll-on/roll-off (RoRo) vessel, and other types of machinery. Breakbulk cargo totaled nearly 211,000 metric tons in 2017, and as of November 2018

breakbulk cargoes have increased 20.5% year-over-year.[4] Breakbulk cargoes are transported through East Blair One, Terminal 7, and Husky Terminal in the South Harbor, and T115 (and to a lesser extent among other container terminals) in the North Harbor.

Fuel and molasses are both transported as liquid bulk at the Port of Seattle. Combined, fuel and molasses cargo handled through the NWSA totaled nearly 752,000 metric tons in 2017. The NWSA additionally handles logs at the West Hylebos Log Facility. In 2017 more than 52.7 million board feet of logs and lumber was transported through the Port of Tacoma, representing more than 278,000 metric tons of cargo. (**Exhibit 14**)

Exhibit 14. Breakbulk, Logs, and Other Non-Containerized Marine Cargo, The NWSA, 2013-2017



Source: The Northwest Seaport Alliance, 2018; Community Attributes, Inc., 2019.

Breakbulk, logs, and other non-containerized marine cargo handled through The Northwest Seaport Alliance directly support a wide variety of jobs. In total these activities directly supported 3,880 jobs in 2017. The average annual income, including benefits, among all direct jobs supported by breakbulk, logs, and other non-containerized marine cargo was more than $74,800 in 2017. Rail and truck transportation and logistics represent the largest portion of direct jobs, with a combined total of 2,790 jobs. Additional services supporting the movement of breakbulk, logs, and other non-containerized marine cargo are maritime support services and navigational services including tug assist and pilots (780 jobs); government personnel (200

[4] The Northwest Seaport Alliance 5-Year Cargo Volume History, November 2018.

jobs); and terminal operations, on-site stevedoring, and longshore workers (110 jobs). (**Exhibit 15**)

Exhibit 15. Estimated Direct Impacts of Breakbulk, Logs, and Other Non-Containerized Marine Cargo by Economic Activity, Washington, 2017

Activity	Jobs	Business Output (mils 2017 $)	Labor Income (mils 2017 $)
Rail Transportation	1,690	$470.4	$74.8
Truck Transportation, Logistics & Warehousing	1,100	$300.9	$105.1
Maritime Support Services	440	$65.3	$42.0
Navigational Services	340	$101.6	$43.3
Government	200	$12.6	$16.2
Terminal Operations, Stevedoring, and Longshoremen	110	$61.4	$10.4
Total	**3,880**	**$1,012.2**	**$291.9**

Sources: Port of Seattle, 2018; Puget Sound Regional Council, 2018; Pacific Maritime Association, 2018; BNSF, 2018; Union Pacific, 2018; Washington Maritime Federation, 2018; Washington State Department of Revenue, 2018; Washington State Employment Security Department, 2018; Community Attributes Inc., 2019.

The direct economic activities supported by the transport of breakbulk, logs, and other non-containerized marine cargo through The Northwest Seaport Alliance lead to upstream supply chain activities and the spending of worker income. The companies supplying goods and services to businesses working with marine cargo operations at the NWSA make their own purchases, stimulating indirect activity. Workers directly supported by marine cargo operations at the NWSA and at business throughout the supply chain spend their earnings on various goods and services generating induced effects.

The total economic impact of breakbulk, logs, and other non-containerized marine cargo shipments handled through the NWSA represents the sum of direct, indirect, and induced effects. **Exhibit 16** summarizes impacts to Washington state. In total, economic impact totaled more than $2 billion in business output in 2017, 3,900 jobs, and nearly $608 million in total compensation.

Exhibit 16. Economic Impacts of Breakbulk, Logs, and Other Non-Containerized Marine Cargo Shipping through The Northwest Seaport Alliance, Washington, 2017

	Direct	Indirect	Induced	Total
Jobs	3,900	2,100	3,600	9,600
Total Compensation (mils 2017 $)	$291.9	$127.8	$188.1	$607.8
Business Output (mils 2017 $)	$1,012.2	$452.0	$555.1	$2,019.4

Sources: Washington State Office of Financial Management, 2018; Community Attributes Inc., 2019.

THE NORTHWEST SEAPORT ALLIANCE

Summary of The Northwest Seaport Alliance Marine Cargo Impacts

The Northwest Seaport Alliance cargo handling activities in 2017 had a total economic impact to the state economy of 58,400 jobs (**Exhibit 17**); this equates to a jobs multiplier, measured as total jobs (58,400) to direct jobs (20,100), of 2.9. The largest component of this impact was containerized cargo, owing to the size, breadth, complexity, and robustness of the network of services tied to moving containerized cargo, such as tug assists and towing, stevedoring, drayage, warehousing, and rail activities. Nearly $12.4 billion in business output, or revenues, were supported either directly or through multiplier effects from the NWSA activities across the state (**Exhibit 18**), and more than $4.0 billion in labor income (**Exhibit 19**).

Exhibit 17. Total Jobs Impacts of The Northwest Seaport Alliance Marine Cargo by Segment, Washington, 2017

	Direct	Indirect	Induced	Total
Containerized Cargo	14,900	11,900	18,700	45,500
Automobiles	1,300	700	1,300	3,300
Breakbulk, Logs, and Other Cargo	3,900	2,100	3,600	9,600
Total	**20,100**	**14,700**	**23,600**	**58,400**

Sources: Washington State Office of Financial Management, 2018; Community Attributes Inc., 2019.

Exhibit 18. Total Business Output Impacts of The Northwest Seaport Alliance Marine Cargo by Segment, Mils 2017$, Washington, 2017

	Direct	Indirect	Induced	Total
Containerized Cargo	$4,537.6	$2,267.7	$2,917.3	$9,722.6
Automobiles	$308.8	$136.8	$197.8	$643.4
Breakbulk, Logs, and Other Cargo	$1,012.2	$452.0	$555.1	$2,019.4
Total	**$5,858.7**	**$2,856.6**	**$3,670.2**	**$12,385.4**

Sources: Washington State Office of Financial Management, 2018; Community Attributes Inc., 2019.

Exhibit 19. Total Labor Income Impacts of The Northwest Seaport Alliance Marine Cargo by Segment, Mils 2017$, Washington, 2017

	Direct	Indirect	Induced	Total
Containerized Cargo	$1,502.5	$703.1	$988.6	$3,194.1
Automobiles	$108.4	$41.2	$67.0	$216.6
Breakbulk, Logs, and Other Cargo	$291.9	$127.8	$188.1	$607.8
Total	**$1,902.7**	**$872.1**	**$1,243.7**	**$4,018.5**

Sources: Washington State Office of Financial Management, 2018; Community Attributes Inc., 2019.

Impacts are difficult to evaluate without additional context, both in terms of the total absolute impact and a ratio of total impacts to direct activities. To build context for the NWSA impacts, several other major industries and activities are presented for comparison. The aerospace industry, including The Boeing Company, Washington's largest private sector employer, supported a total of 252,000 jobs in 2015, but with a jobs multiplier actually lower than for the NWSA (2.7 compared to 2.9). The agriculture & food processing sector, representing an extensive supply chain linking farmers, processors, wholesalers, and various equipment and seed suppliers, supported 220,600 jobs and $19.5 billion in business output across the state economy in 2013, including indirect and induced effects and a jobs multiplier of 1.7. The maritime sector, including several activities overlapping with those of the NWSA, had an estimated jobs multiplier of 2.7. **Exhibit 20** below summarizes the comparison between the NWSA and other illustrative industries and economic activities in Washington state.

Exhibit 20. Comparison of Direct and Total Economic Impacts between The NWSA and Other Industries and Industry Clusters in Washington State, Various Years

	Aerospace	Agriculture & Food Processing	Maritime Sector	The NWSA
Study Year	2015	2013	2015	2017
Total Jobs	252,800	220,600	191,100	58,400
Direct Jobs	93,800	128,900	69,500	20,100
Direct Business Output (mils $)	$68,641	$19,488	$17,142	$5,858
Total Jobs per Direct Job	2.70	1.71	2.75	2.91
Jobs/$Mil Final Demand	3.68	11.32	11.15	9.97

Note: all studies were produced by Community Attributes Inc. on behalf of each organization. Sources: Washington Aerospace Partnership, "Washington State Aerospace Economic Impacts 2016 Update," October 2016; Washington Farm Bureau, "Washington State Agriculture & Food Processing Economic/Fiscal Impact Study," January 2015; Washington Maritime Federation, "Washington State Maritime Sector Economic Impact Study," April 2017; Community Attributes Inc., 2019.

Fiscal Impacts from The NWSA Marine Cargo Activities

The economic impacts of marine cargo at The Northwest Seaport Alliance support various state tax bases, which in turn yield tax revenues. The businesses that directly interact with the marine cargo generate taxes directly. The indirect and induced activities generated by both public and private sector expenditures generate additional taxable revenue. Tax impacts evaluated in this study include statewide business and occupation taxes, state sales and use taxes, and various other, albeit smaller, state taxes, such as quantity taxes.

The direct and secondary economic activities related to marine cargo at the NWSA generate nearly $136 million in Washington state sales and use taxes, Washington state business and occupation taxes and other statewide taxes (for example, public utility taxes and quantity taxes)[5]. This includes nearly $107 million generated through containerized cargo related activities or more than $28 per TEU, $8 million generated by automobile cargoes and $21 million from breakbulk, logs, and other non-containerized cargo. (**Exhibit 21 and 22**)

Exhibit 21. Statewide Fiscal Impacts by Segment of Activity at The Northwest Seaport Alliance, Washington, Mils 2017$, 2017

	Direct	Secondary	Total
Containerized Cargo	$25.1	$81.7	$106.8
Automobiles	$2.7	$5.3	$8.0
Breakbulk, Logs, and Other Cargo	$5.5	$15.6	$21.1
Total	**$33.3**	**$102.6**	**$135.9**

Sources: Washington State Department of Revenue, 2018; Washington State Employment Security Department, 2018; Community Attributes Inc., 2019.

Exhibit 22. Total Statewide Fiscal Impacts of The Northwest Seaport Alliance, Washington, Mils 2017$, 2017

	Direct	Secondary	Total
B&O	$12.5	$26.8	$39.3
Sales & Use Taxes	$17.6	$66.3	$83.9
Other	$3.2	$9.4	$12.6
Total	**$33.3**	**$102.6**	**$135.9**

Sources: Washington State Department of Revenue, 2018; Washington State Employment Security Department, 2018; Community Attributes Inc., 2019.

Fiscal impacts are also difficult to evaluate without additional context. The aerospace industry had a total fiscal impact of $352.2 million in 2015, adjusted to 2017 dollars. The agriculture & food processing sector supported 220,600 jobs in 2013 and had a total fiscal impact of $342.1 million. The maritime sector, which includes several overlapping activities with the NWSA had a total fiscal impact of $361 million in 2015. (**Exhibit 23**)

[5] Due to limited availability of tax data at the local level, only state tax payments were estimated for Washington state.

Exhibit 23. Comparison of Direct and Total State Fiscal Impacts between The NWSA and Other Industries and Industry Clusters in Washington State, Various Years (mils 2017$)

	Study Year	Direct	Total
Aerospace	2015	$30.4	$352.2
Agriculture & Food Processing	2013	$86.4	$342.1
Maritime Sector	2015	$115.7	$361.0
The NWSA	2017	$33.3	$135.9

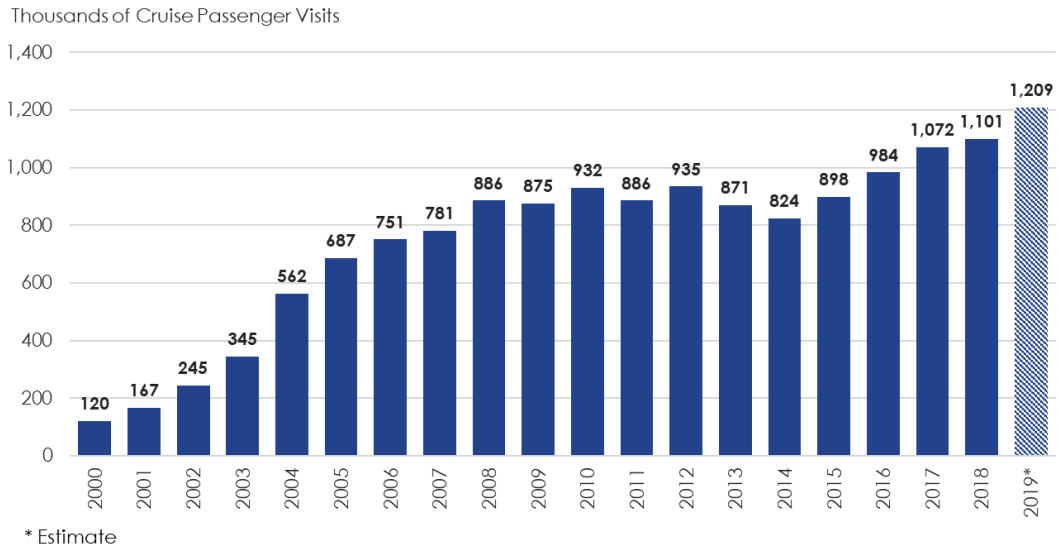
Note: all studies were produced by Community Attributes Inc. on behalf of each organization. Sources: Washington Aerospace Partnership, "Washington State Aerospace Economic Impacts 2016 Update," October 2016; Washington Farm Bureau, "Washington State Agriculture & Food Processing Economic/Fiscal Impact Study," January 2015; Washington Maritime Federation, "Washington State Maritime Sector Economic Impact Study," April 2017; Community Attributes Inc., 2019.

CRUISE SHIP INDUSTRY, 2019

The cruise ship industry in Seattle has grown from nearly 120,000 passengers in 2000 to an estimated 1.2 million in 2019. Cruise lines utilizing Port of Seattle infrastructure support the state economy through visitor spending, crew expenditures and cruise operations.

In 2019, the Port of Seattle will host 213 calls from ten different cruise lines and 18 ships. The industry in Seattle has grown from nearly 120,000 passengers in 2000 to an estimated 1.2 million in 2019. Passenger increases between 2000 and 2019 represent a compound annual growth rate of 13%. (**Exhibit 24**)

Exhibit 24. Passenger Embarkments, Disembarkments, and In-Transit Stops, Port of Seattle, 2000-2019



Source: Port of Seattle, 2019

A total of seven cruise lines will homeport at the Port of Seattle, including Holland America Line, Norwegian Cruise Line, Princess Cruises, Carnival Cruise Lines, Royal Caribbean, Celebrity Cruises, and Oceania Cruises. Vessels that homeport at the Port of Seattle have passengers embarking and disembarking at the beginning and end of their trips. Homeport vessels take on supplies, handle passenger baggage, provide shore services to passengers, conduct maintenance, and more. For other cruise lines and vessels, the Port of Seattle is a port of call, an intermediary stop on a cruise. Port of call passengers typically spend less than 10 hours in Seattle, and provisioning and maintenance activities rarely occur. In 2019, vessels will make 201 homeport calls and 11 port of call visits in Seattle.

Analytics presented in this section draw on extensive data gathered on 2017 actual cruise activities. This data was then used to develop a cruise industry impact model capturing the various types of impacts of cruise operations to the region, such as cruise ship local procurement, on-shore support services, and cruise passenger on-shore spending before and after a cruise. This model was then applied to the projected 2019 cruise schedule using the expected number of vessels calls and passengers, based on data provided by the Port of Seattle. Cruise industry impacts are disaggregated by: 1) cruise passenger

spending on local goods and services; 2) crew expenditures in the local economy; and 3) cruise operations, including payroll, procurement from local vendors, and on-shore services. The impacts to Washington of crew onboard cruise ships is limited to their expenditures in the local economy and only a small portion of total crew disembark to visit the region during any vessel call.

In 2017, the Port of Seattle commissioned the McDowell Group to conduct a survey of cruise passengers. This survey found that 89% of respondents were non-Washington residents. Of these, 65% spent at least four hours in Seattle before or after their cruise.

The average length of stay among non-resident passengers staying overnight before or after their cruise embarkment was two days. Non-resident passengers spending time in Seattle spent an average of $850 per party pre-cruise and $697 post-cruise, or a total of $1,547. Categories of passenger spending include lodging, food and beverage, entertainment, transportation, and gifts and souvenirs. (**Exhibit 25**)

Exhibit 25. Average Cruise Visitor Spending in Seattle by Category, 2017

Category	Pre-Cruise	Post-Cruise
Lodging	$398	$243
Food and beverage	$185	$161
Entertainment	$107	$135
Transportation	$94	$92
Gifts, souvenirs, clothing	$62	$64
Other	$4	$2
Total Average Spending	**$850**	**$697**

Note: the inclusion of pre- and post-cruise spending reflects the structure of the survey deployed by McDowell Group in 2017.
Source: Port of Seattle Cruise Passenger Survey, 2017

In 2019, Port of Seattle cruise line visitor spending is estimated to directly generate $226.8 million in business output and will support an estimated 2,490 jobs, and $83.2 million in wages including benefits. (**Exhibit 26**)

Cruise staff also generate impacts in the local economy through their local spending. Between vessel debarkations and embarkations at homeport and port of call visits a small proportion of cruise crew spend their earned income on food and beverage, souvenirs, and entertainment. The Cruise Lines International Association's report "The Contribution of the International Cruise Industry to the U.S. Economy in 2016" estimates that average crew spending per visit is $47.06. Crew spending in 2019 is estimated to generate $2.1 million in output in 2019, will support 30 jobs, and $0.9 million in wages and benefits in Washington. (**Exhibit 26**)

In 2019, cruise operation expenditures, including fuel, food and beverage procurement, various onboard accommodation purchases, and maintenance, are estimated to sum to $182.7 million. Various on-shore operations provide services for cruises, such as on-shore cruise line staff handling boarding and baggage, longshoremen, and Port of Seattle personnel. Additionally, tugboat companies provide inner harbor tug assists along with various maritime support services. In total, the on-shore operations supported by the cruise industry in 2019 are estimated to generate business output of more than $56.2 million.

Exhibit 26. Projected Direct Impacts by Economic Activity of Cruise Operations at the Port of Seattle, Washington, 2019

Activity	Jobs	Revenues (mils 2018 $)	Wages (mils 2018 $)
Passenger Spending	2,490	$226.8	$83.2
On Shore Staff	200	$28.4	$14.5
Maritime Services	130	$27.8	$14.2
Maintenance	90	$24.2	$7.4
Provisioning	30	$60.2	$0.7
Fuel	20	$98.3	$1.7
Crew Spending	30	$2.1	$0.9
Total	**2,990**	**$467.8**	**$122.7**

Sources: Port of Seattle, 2018; Holland America Group, 2018; Norwegian Cruise Lines, 2018; Port of Seattle Passenger Survey, 2017; Cruise Lines International Association, 2018; Washington State Department of Revenue, 2018; Washington State Employment Security Department, 2018; Community Attributes Inc., 2019.

The cruise industry at the Port of Seattle will directly support an estimated nearly 3,000 jobs, with average annual wages, including benefits of nearly $41,000. The total economic impact of cruise ships to the state economy in 2019, including direct, indirect, and induced impacts, is estimated at 5,500 jobs, $260.1 million in labor income, and $893.6 million in business output (**Exhibit 27**). Based on these estimates, in 2019 each vessel call will support a total of $4.2 million in economic activity to the region. This represents an increase over previous Port of Seattle studies due to: 1) a revised and more thorough 2017 study of passenger spending locally; and 2) an increase in cruise operation expenditures in the region.

Exhibit 27. Projected Economic Impacts of Cruise Ship Operations at the Port of Seattle, Washington, 2019

	Direct	Indirect	Induced	Total
Jobs	3,000	1,000	1,500	5,500
Total Compensation (mils 2018 $)	$122.7	$56.9	$80.5	$260.1
Business Output (mils 2018 $)	$467.8	$188.3	$237.6	$893.6

Sources: Washington State Office of Financial Management, 2018; St. Louis FRED, 2018; Community Attributes Inc., 2019.

The economic impacts of cruise operations at the Port of Seattle in 2019 will support various state tax bases, which in turn yield tax revenues. The direct and secondary activities of cruise operations in 2019 will generate $10.7 million in state sales and use taxes, an additional $3.8 million in business and occupation taxes, and other statewide taxes. In total the cruise industry, supported by the Port of Seattle, will generate an estimated $14.5 million in statewide taxes directly and through multiplier effects in 2019. (**Exhibit 28**)

Exhibit 28. Projected Statewide Fiscal Impacts of Cruise Ship Operations at the Port of Seattle, Washington, Mils 2018$, 2019

	Direct	Secondary	Total
B&O	$1.0	$1.8	$2.8
Sales & Use Taxes	$6.4	$4.4	$10.7
Other	$0.4	$0.6	$1.0
Total	**$7.8**	**$6.7**	**$14.5**

Sources: Washington State Department of Revenue, 2018; Washington State Employment Security Department, 2018; Community Attributes Inc., 2019.

COMMERCIAL FISHING

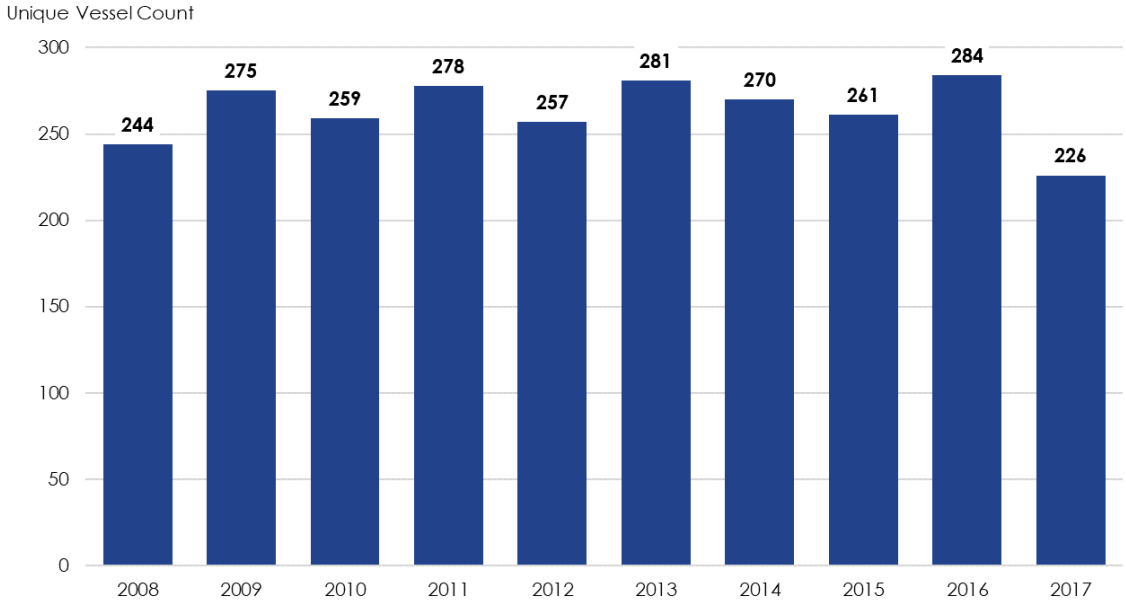
Port of Seattle plays a critical role in supporting the regional fishing industry. This section outlines the impacts of the at least 300 fishing vessels utilizing Port of Seattle facilities and the associated business operations that offer services critical to the industry.

The Port of Seattle owns and operates three facilities that serve as core assets for the regional fishing industry: 1) Fishermen's Terminal; 2) the nearby Maritime Industrial Center, or "MIC"; and 3) Terminal 91, which in addition to serving cruise ships provides loading and offloading for some of the region's largest fishing vessels.

The Port of Seattle is heavily utilized by a large segment of the North Pacific Fisheries Fleet, including vessels engaged in the harvest of pollock, Alaskan king crab, groundfish, and salmon, among many other high value species. A smaller cohort of moored fishing vessels at Fishermen's Terminal operate in non-Alaskan fishing grounds, including in Puget Sound and off the West Coast of the Olympic Peninsula.

In 2017, more than 300 fishing vessels utilized Port of Seattle facilities. Of these, 226 were identified as actively fishing in Alaskan fisheries, based on the Alaska Commercial Fishing Entry Commission licensing data (**Exhibit 29**). In some cases, while a vessel may moor more frequently in other locations (such as in Alaska or in Lake Union in Seattle), these vessels still depend on Port of Seattle infrastructure for loading and offloading, on-dock repairs and periodic maintenance, and provisioning.

Exhibit 29. Unique Alaskan Fisheries Licensed Vessels Utilizing Port of Seattle Facilities, 2008-2017



Note: Some vessels utilize more than one facility throughout the course of a year. Estimates thus report unique vessels and correct for some double-counting.
Sources: Port of Seattle, 2018; Alaska Commercial Fishing Entry Commission, 2018; Community Attributes Inc., 2019.

There are also various supporting and associated businesses and operations located at Port of Seattle facilities in close proximity to the fishing fleet, such as equipment wholesalers, associations, nearby by on-dock mechanics and maintenance workers, maritime law firms and insurance companies, and other services critical to the industry.

In 2017, fishing vessels that moored at Port of Seattle facilities operating in the Alaskan fisheries generated gross earnings of more $455.0 million. An additional $26.6 million in revenues were earned in waters outside of Alaska, such as in Puget Sound and Washington's west coast, based on ex-vessel wholesale value. Additional revenues were generated among various support services and on-shore Port of Seattle tenants, including seafood processing and cold storage facilities, services businesses at Fishermen's Terminal and the economic output equivalent of Port of Seattle staff dedicated to serving the industry. In total, these activities directly supported an additional $189.7 million in business output.

Factoring in all segments of commercial fishing at the Port of Seattle, these activities generated more than $671.2 million in business output in 2017.

In 2017, an estimated 7,200 jobs were directly associated with commercial fishing at the Port of Seattle. These included 5,100 jobs on fishing vessels, the majority of which (4,900) operated in fisheries in Alaska. The number of jobs across fishing vessel customers at the Port of Seattle vary widely by vessel size and type, such as between from large, 150 crew catcher-processors to much smaller seiners and trawlers. In some cases, notably the largest fish processors that use Terminal 91, may primarily moor at locations outside Port of Seattle properties, but due to the size of vessel require use of the Port's facilities for loading and offloading.

These jobs supported labor compensation of $313.4 million in 2017. Of this, $150.3 million were earned from fishing employment, with another $163.1 million from onshore terminal-based jobs, Port of Seattle on-site processing and cold storage, and Port of Seattle staff positions. These estimates represent annual averages, thus accounting for the seasonality of many (but not all) types of fishing employment, such as work that lasts 3-6 months. Overall, direct commercial fishing jobs supported by the Port of Seattle have an annual average wage, including benefits, of more than $43,500 in 2017, in part reflecting the seasonal nature of many commercial fishing jobs.

Factoring in indirect and induced impacts, the total statewide economic impact of commercial fishing operations summed to 11,300 jobs, $543.0 million in labor income, and more than $1.4 billion in business output in 2017 (**Exhibit 30**).

Exhibit 30. Economic Impacts of Commercial Fishing Operations Based at the Port of Seattle, Washington, 2017

	Direct	Indirect	Induced	Total
Jobs	7,200	900	3,200	11,300
Total Compensation (mils 2017 $)	$313.4	$61.5	$168.0	$543.0
Business Output (mils 2017 $)	$671.3	$270.7	$495.9	$1,438.0

Sources: Washington State Office of Financial Management, 2018; Community Attributes Inc., 2019.

In 2017, the direct and secondary activities supported by commercial fishing operations based at the Port of Seattle generated a total of $8.1 million in state sales and use taxes, $3.8 million business and operations taxes, and $1.3 million in other state taxes. In total, commercial fishing operations at the Port of Seattle supported $13.2 million in statewide fiscal impacts. (**Exhibit 31**)

Exhibit 31. Total Statewide Fiscal Impacts of Commercial Fishing Operations Based at the Port of Seattle, Washington, Mils 2017$, 2017

	Direct	Secondary	Total
B&O	$0.7	$3.1	$3.8
Sales & Use Taxes	$0.6	$7.5	$8.1
Other	$0.1	$1.2	$1.3
Total	**$1.4**	**$11.8**	**$13.2**

Sources: Washington State Department of Revenue, 2018; Washington State Employment Security Department, 2018; Community Attributes Inc., 2019.

North Pacific and U.S. Fisheries

In 2017, 226 fishing vessels operating in the North Pacific Fisheries utilized Port of Seattle facilities throughout the year, such as for periodic maintenance and repair or loading and offloading. In 2017, gross earnings in Alaska's fisheries totaled more than $1.0 billion. The revenues generated in 2017 by Port of Seattle vessels from fishing in Alaska—$455.0 million—represented 44% of all gross earnings from the North Pacific Fisheries. Port of Seattle fishing vessel operator customers harvested catch (Alaska and non-Alaska) are equal to an estimated 13% by value of total U.S. commercial fisheries in 2017 by dollar value.[6]

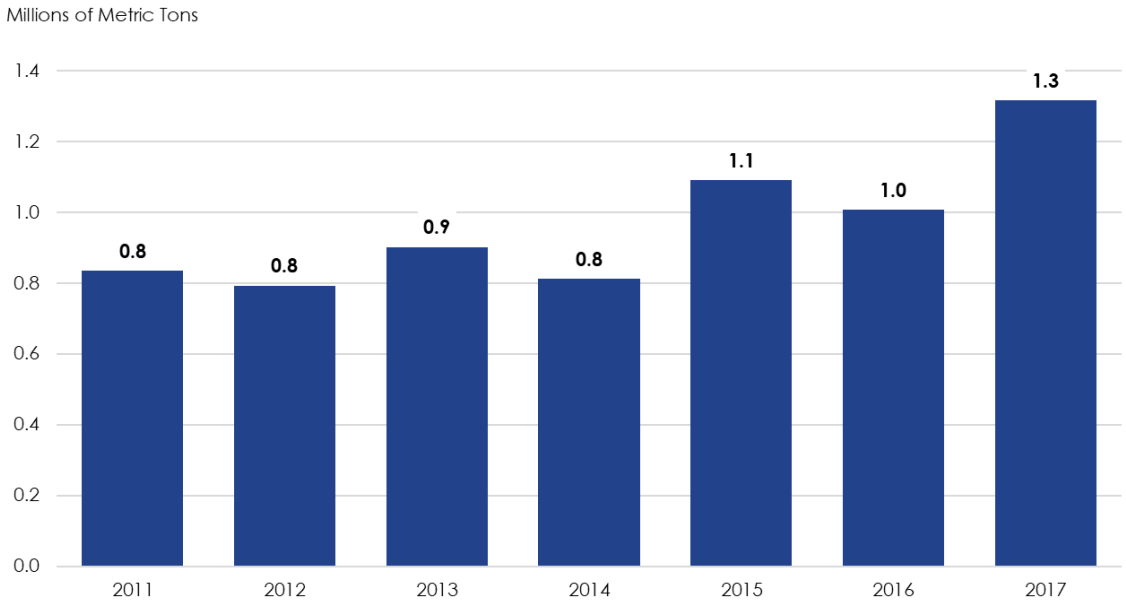
Between 2011 and 2017, Port of Seattle customers harvested between 800,000 and 1.3 million metric tons of seafood from the North Pacific Fisheries (**Exhibit 32**), or equivalent gross earnings of between $259.1 million and $455.0, adjusted for inflation (**Exhibit 33**). Harvested tonnage increased by more than 500% over this period, or approximately 23% per year, based on a compound annual growth rate.

An estimated 72% of all commercially caught seafood biomass from the U.S. North Pacific Fisheries by tonnage and value was exported.[7] A large share of pollock, salmon and other harvested biomass undergoes preliminary processing in Alaska (removal of head and tail). It is then packed in ice and shipped to locations in East Asia, such as several facilities in China, for deboning, filleting, and additional value-added food processing before reshipment back to the U.S. and other markets for final consumption.

[6] Sources: State of Alaska Department of Fish & Game, 2018; National Oceanic and Atmospheric Administration (NOAA), 2018; Community Attributes Inc., 2019.

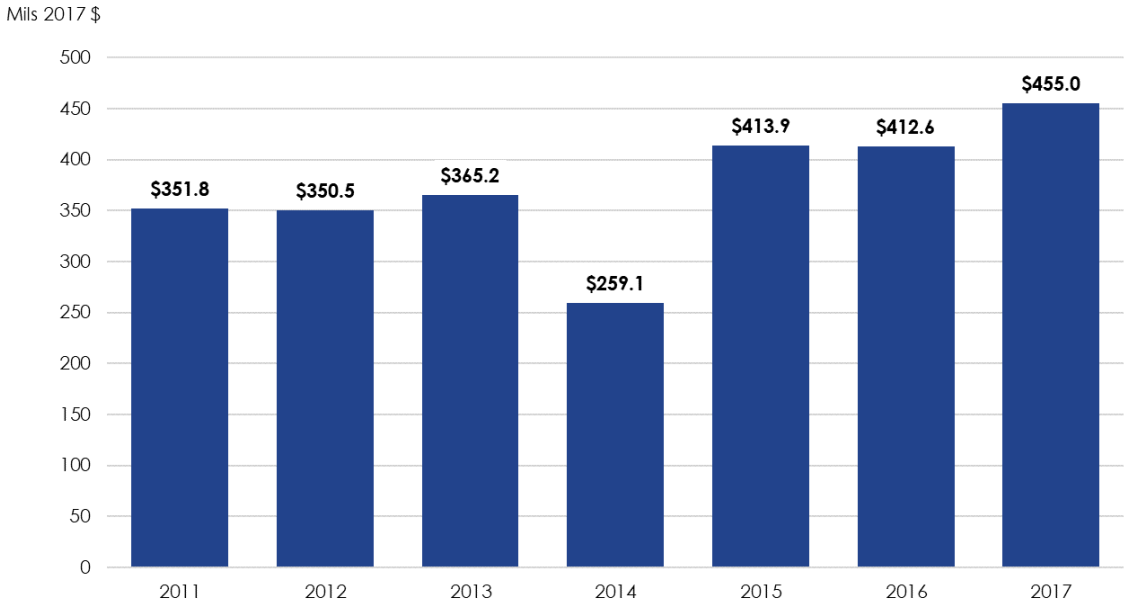
[7] This estimate is based on the weighted multi-year average, inflation-adjusted, of estimated export value to "first wholesale value" for Alaska commercial seafood for the years 2011 to 2015. Data come from the Alaska Seafood Marketing Institute, "Alaska Seafood Export Market Analysis," 2016; with inflation adjustments performed by Community Attributes Inc. using GDP implicit price deflators published by the U.S. Bureau of Economic Analysis, 2019.

Exhibit 32. Tonnage Harvested by Port of Seattle Customers in North Pacific Fisheries, 2011-2017



Sources: Alaska Commercial Fishing Entry Commission, 2018; Community Attributes Inc., 2019.

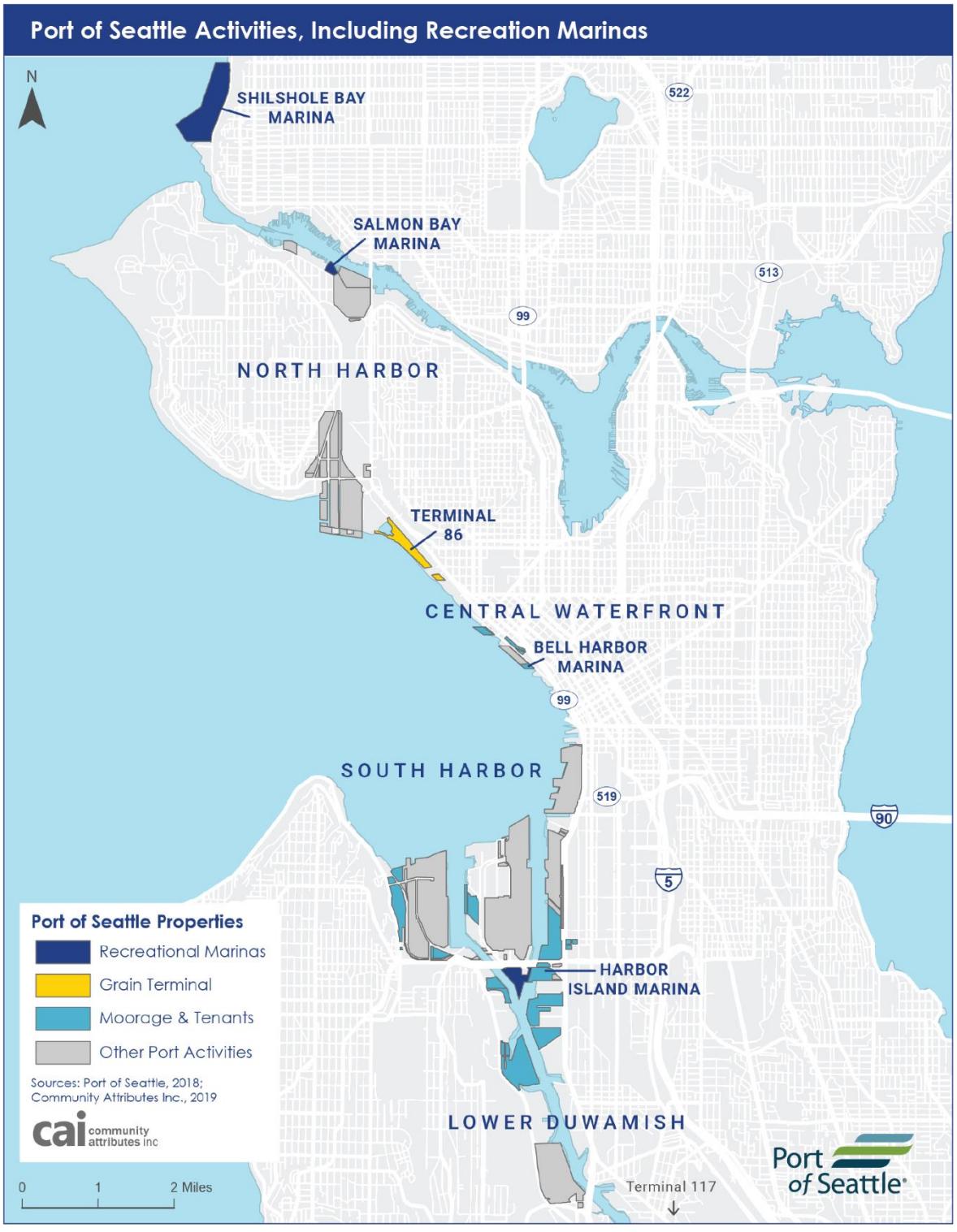
Exhibit 33. Gross Earnings by Port of Seattle Customers in North Pacific Fisheries, 2011-2017



Sources: Alaska Commercial Fishing Entry Commission, 2018; Community Attributes Inc., 2019.

OTHER PORT OF SEATTLE ACTIVITIES INCLUDING RECREATIONAL MARINAS

Port of Seattle is home to an extensive portfolio of real estate assets and tenants. Supported activities include recreational marinas, industrial and non industrial tenants, the moorage of tugs, barges and more.



In addition to The Northwest Seaport Alliance operations, commercial fishing, and cruise ships, the Port of Seattle is also home to an extensive portfolio of real estate assets and tenants. These activities range from recreational marinas, moorage of tugboat and barges for local common and contract carriers, the grain facility at Terminal 86, non-maritime industrial tenants, to the moorage of research vessels.

The Port of Seattle is home to four recreational marinas: Shilshole Marina, Harbor Island Marina, Salmon Bay Marina, and Bell Harbor Marina. Of these, Shilshole is the largest, with capacity for more than 1,400 vessels. Shilshole is also home to Washington's largest liveaboard community with capacity for 350 live-aboard vessels. Recreational marinas support various economic activities, including marina support staff, onsite restaurants, bars and related food services, fuel, and vessel maintenance and repair services.

Port facilities are also used for a wide variety of other activities. The Port of Seattle offers moorage for tugs and barges, as well as research vessels. Tenants at the Port of Seattle range from construction and architecture companies, to manufacturers and retailers, as well as a wide variety of services outside of those that directly handle marine cargo included under The Northwest Seaport Alliance.

Tug and barge operators provide inter-harbor and long-distance conveying of non-containerized cargo, such as building materials to and from marine construction sites, shipments to Alaska, and towing of industrial equipment. Tug and barge operators that utilize Port of Seattle facilities include Crowley Marine Services, Foss Maritime, General Construction, Manson Construction, and others. In total, tug, barge, and marine construction dockage and moorage leases generated nearly $2.4 million in revenue for the Port of Seattle in 2017.

Research vessels mooring at Port of Seattle facilities in 2017 included three vessels operated by the National Oceanic and Atmospheric Administration, as well as the Sikuliaq, operated by the University of Alaska. These vessels depend upon Port of Seattle facilities for seasonal moorage between research missions as well as essential maintenance and inspection services. These four research vessels conduct a wide variety of research including ocean mapping and activities to support fisheries.

The Port also owns and leases industrial lands to non-maritime tenants. Examples include warehousing of non-containerized cargo, local manufacturers, retail, and services.

Exhibit 34. Estimated Direct Impacts of Port of Seattle Recreational Marinas and Other Port Business, Washington, 2017

Segment	Jobs	Business Output (mils $)	Labor Income (mils $)
Port of Seattle Tenants	2,400	$514.9	$217.6
Vessel Moorage and Barge and Tug Tenants	820	$126.0	$104.5
Recreational Marinas	200	$29.6	$13.9
Port of Seattle Staff	110	$34.0	$13.0
Bulk Cargo Operations	90	$24.3	$8.2
Total	**3,620**	**$728.8**	**$357.2**

Sources: Puget Sound Regional Council, 2019; Washington State Employment Security Department, 2018; Washington State Department of Revenue, 2018; Port of Seattle, 2018; Community Attributes Inc., 2019.

There were an estimated 200 jobs directly tied to recreational marinas, with an associated $13.9 million in labor income and $29.6 million in output. In total, recreational marinas and other Port of Seattle business directly supported more than 3,600 jobs, more than $357 million in labor compensation, and nearly $729 million in business output.

An additional 200 jobs were supported through indirect and induced impacts from recreational marina activities. Nearly all direct impacts from recreational marinas were attributed to Shilshole Marina. Factoring in indirect and induced impacts, recreational marinas at the Port of Seattle supported $65.2 million in total business output, of which $23.3 million was through induced impacts. Total labor income impacts summed to $25.5 million (**Exhibit 35**).

Exhibit 35. Economic Impacts of Recreational Marinas at the Port of Seattle, Washington, 2017

	Direct	Indirect	Induced	Total
Jobs	200	100	100	400
Total Compensation (mils 2017 $)	$13.9	$3.7	$7.9	$25.5
Business Output (mils 2017 $)	$29.6	$12.3	$23.3	$65.2

Sources: Washington State Office of Financial Management, 2018; Community Attributes Inc., 2019.

Other port business includes industrial and non-industrial activities and Port tenants, ranging from bulk cargo handling and support services (such as the grain facility at T-86), research vessels moored at Port of Seattle facilities, construction and engineering firms with activities on Port of Seattle facilities, cargo and barge operations with barges moored on Port property, various non-industrial Port tenants and Port of Seattle staff supporting these activities. In 2017, an estimated 3,400 jobs, $343.3 million in labor income, and $699.2 million in business output were directly tied to these activities. The total economic impact of other port business, including indirect and induced impacts, summed to 8,400 jobs, $616.5 million in labor income, and nearly $1.6 billion in business output (**Exhibit 36**).

Exhibit 36. Economic Impacts of Other Port of Seattle Business, Washington, 2017

	Direct	Indirect	Induced	Total
Jobs	3,400	1,400	3,600	8,400
Total Compensation (mils 2017 $)	$343.3	$82.4	$190.8	$616.5
Business Output (mils 2017 $)	$699.2	$290.6	$563.1	$1,552.8

Sources: Washington State Office of Financial Management, 2018; Community Attributes Inc., 2019.

Overall, the direct and secondary impacts of recreational marinas, dockage and moorage, industrial and non-industrial Port of Seattle tenants, and all other Port of Seattle business generated $15.2 million in state sales and use taxes in 2017. Additionally, these impacts generated $7.7 million in other taxes and supported through direct and secondary impacts a total of nearly $23 million in state taxes. (**Exhibit 37**)

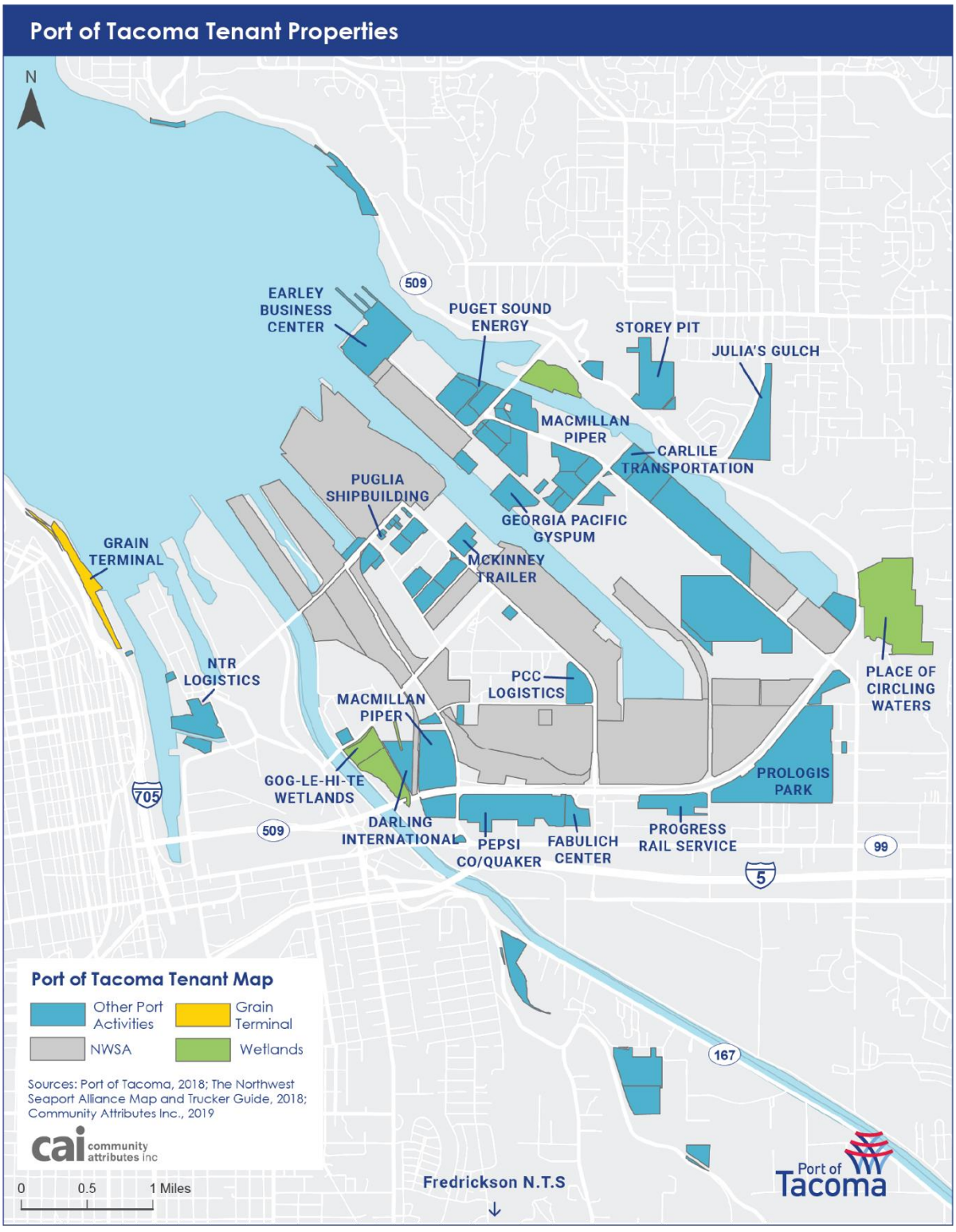
Exhibit 37. Total Statewide Fiscal Impacts of Recreational Marinas and Other Port of Seattle Business, Washington, Mils 2017$, 2017

	Direct	Secondary	Total
B&O	$2.1	$3.9	$6.0
Sales & Use Taxes	$6.0	$9.2	$15.2
Other	$0.4	$1.3	$1.7
Total	**$8.5**	**$14.3**	**$22.9**

Sources: Washington State Department of Revenue, 2018; Washington State Employment Security Department, 2018; Community Attributes Inc., 2019.

TENANTS & OTHER BUSINESS

The Port of Tacoma, beyond supporting marine cargo through The Northwest Seaport Alliance, has a portfolio of real estate properties. The Port of Tacoma provides industrial and non industrial space for a wide variety of activities.



The Port of Tacoma has more than 2,700 acres of real estate property. Many tenants on those properties directly support the marine cargo operations of The Northwest Seaport Alliance. However, the Port of Tacoma is home to a wide range of industrial and non-industrial tenants and activities. The Earley Business Center is home to SAFE Boats for the manufacture of their largest boats. The Fabulich Center provides commercial office space for tenants, including non-NWSA government employees. Other tenants utilizing Port of Tacoma properties include Trident Seafoods, Darling International, North West Company, Pepsi Co/Quaker, Americold, Puget Sound Energy, and many others.

Outside of the NWSA marine cargo operations, the Port of Tacoma also provides bulk cargo operations at the TEMCO Grain Terminal, as well as bulk gypsum operations for the wallboard manufacturing activities of Georgia Pacific Gypsum.

In 2017, Port of Tacoma tenant and bulk activities summed to 1,500 direct jobs, $849.4 million in business output, and $109.8 million in labor income (**Exhibit 38**).

Exhibit 38. Estimated Direct Impacts of Port of Tacoma Tenants and Other Business, Washington, 2017

Activity	Jobs	Business Output (mils 2017 $)	Labor Income (mils 2017 $)
Manufacturing	310	$135.7	$23.3
Services and Non-Industrial Tenants	620	$136.0	$44.1
Construction and Resource Operations	250	$76.6	$18.8
Port of Tacoma Government (non-NWSA)	80	$11.1	$3.6
Bulk Operations	260	$490.0	$20.0
Total	**1,520**	**$849.4**	**$109.8**

Note: values may not sum due to rounding. The jobs, income and output of Port of Tacoma tenants does not include those activities among tenants that directly support the marine cargo activities of the NWSA.
Sources: Puget Sound Regional Council, 2019; Washington State Employment Security Department, 2018; Washington State Department of Revenue, 2018; Community Attributes Inc., 2019.

The economic impacts of these varied non-NWSA activities on Port of Tacoma property summed to 5,200 jobs, $326.9 million in labor compensation, and $1.6 billion in business output. Every direct job among the Port's tenants and other non-NWSA activities supported a total of 3.5 jobs across the Washington state economy (**Exhibit 39**).

Exhibit 39. Economic Impacts of Port of Tacoma Tenants and Other Businesses, Washington, 2017

	Direct	Indirect	Induced	Total
Jobs	1,500	1,800	1,900	5,200
Total Compensation (mils 2017 $)	$114.3	$111.4	$101.2	$326.9
Business Output (mils 2017 $)	$852.2	$401.0	$298.6	$1,551.7

Sources: Washington State Office of Financial Management, 2018; Community Attributes Inc., 2019.

The direct and secondary activities of Port of Tacoma tenants and other business supported a total of $9.3 million in state sales and use taxes, as well as $4.3 million in state business and occupation taxes, and an additional $1.5 million in other state taxes. In total, these activities supported a total of $15.4 million in state taxes through direct and secondary activities. (**Exhibit 40**)

Exhibit 40. Total Statewide Fiscal Impacts of Port of Tacoma Tenants and Other Business, Washington, Mils 2017$, 2017

	Direct	Secondary	Total
B&O	$1.4	$2.9	$4.3
Sales & Use Taxes	$3.3	$6.2	$9.5
Other	$0.5	$1.0	$1.5
Total	**$5.3**	**$10.1**	**$15.4**

Sources: Washington State Department of Revenue, 2018; Washington State Employment Security Department, 2018; Community Attributes Inc., 2019.

SUMMARY OF COMBINED TOTAL IMPACTS AND CONCLUSION

Activities at the Port of Seattle, Port of Tacoma, and The Northwest Seaport Alliance have a significant impact on the statewide economy. The Northwest Seaport Alliance directly supported 20,100 jobs in 2017 and $5.9 billion in business output, of which the largest segment was containerized cargo (14,900 jobs and $4.5 billion in business output). Commercial fishing, including vessel operations tied to the North Pacific fisheries in Alaska, directly supported 7,200 jobs and $671.3 million in business output. Other activities at the Port of Seattle (such as recreational marinas) and Port of Tacoma directly supported 3,600 and 1,500 jobs, respectively. The cruise industry, treated separately in this study, is projected to directly support 3,000 jobs, more than $1.0 billion in business output, and $122.7 million in labor income in 2019. (**Exhibit 41**)

Exhibit 41. Estimated Direct Impacts of Port of Seattle, Port of Tacoma, and The Northwest Seaport Alliance, Washington, 2017 and 2019

	Jobs	Business Output (mils)	Labor Income (mils)
The Northwest Seaport Alliance (2017)	20,100	$5,858.7	$1,902.7
Containerized Cargo	14,900	$4,537.6	$1,502.5
Automobiles	1,300	$308.8	$108.4
Breakbulk, Logs and Other Cargo	3,900	$1,012.2	$291.9
Port of Seattle Cruise Industry (2019, 2018$)	3,000	$467.8	$122.7
Port of Seattle Commercial Fishing (2017)	7,200	$671.3	$313.4
Port of Seattle Recreational Marinas and Other Business (2017)	3,600	$728.8	$357.2
Port of Tacoma Tenants and Other Business (2017)	1,500	$852.2	$114.3

Sources: Puget Sound Regional Council, 2019; Washington State Employment Security Department, 2018; Washington State Department of Revenue, 2018; The Northwest Seaport Alliance, 2018; Port of Seattle, 2018; Port of Tacoma, 2018; Community Attributes Inc., 2019.

Total economic impacts represent additional jobs, labor income, and business output supported through upstream business-to-business transactions (indirect) and household consumption expenditures (induced). The combined impacts of The Northwest Seaport Alliance and other activities at each Port, less cruise ship operations, supported 83,700 jobs, $5.5 billion in labor income, and $17.0 billion in business output in 2017 (**Exhibits 42**). Cruise operations has a 2019 projected total economic impact of 5,500 jobs, $260.1 million in labor income, and $893.6 million in business output.

Exhibit 42. Total Economic Impacts of Port of Seattle, Port of Tacoma, and The Northwest Seaport Alliance, Washington, 2017 and 2019

	Jobs	Business Output (mils)	Labor Income (mils)
The Northwest Seaport Alliance (2017)	58,400	$12,385.4	$4,018.5
Containerized Cargo	45,500	$9,722.6	$3,194.1
Automobiles	3,300	$643.4	$216.6
Breakbulk, Logs and Other Cargo	9,600	$2,019.4	$607.8
Port of Seattle Cruise Industry (2019, 2018$)	5,500	$893.6	$260.1
Port of Seattle Commercial Fishing (2017)	11,300	$1,438.0	$543.0
Port of Seattle Recreational Marinas and Other Business (2017)	8,800	$1,618.0	$642.0
Port of Tacoma Tenants and Other Business (2017)	8,400	$1,552.8	$616.5

Sources: Washington State Office of Financial Management, 2018; Community Attributes Inc., 2019.

The economic impacts of the Port of Seattle, Port of Tacoma, and The Northwest Seaport Alliance marine cargo activities and the wide variety of other activities across the Ports of Seattle and Tacoma support various state tax bases, which in turn yield tax revenue. Much of the private sector marine cargo and tenant activity generates taxes directly. The indirect and induced activities generated by both public and private sector expenditures generate additional state sales and use taxes, business and occupation taxes, and other taxes (public utility taxes, quantity taxes, and others). These fiscal impacts are summarized in **Exhibit 43** below.

Exhibit 43. Direct and Total Fiscal Impacts of the Port of Seattle, Port of Tacoma, and The Northwest Seaport Alliance, Washington, 2017 and 2019

	Direct (mils)	Total (mils)
The Northwest Seaport Alliance (2017)	$33.3	$135.9
Containerized Cargo	$25.1	$106.8
Automobiles	$2.7	$8.0
Breakbulk, Logs and Other Cargo	$5.5	$21.1
Port of Seattle Cruise Industry (2019, 2018$)	$7.8	$22.9
Port of Seattle Commercial Fishing (2017)	$1.4	$13.2
Port of Seattle Recreational Marinas and Other Business (2017)	$8.5	$22.9
Port of Tacoma Tenants and Other Business (2017)	$5.3	$15.4

Sources: Washington State Office of Financial Management, 2018; Community Attributes Inc., 2019.

APPENDIX

Data Sources

Analysis in this report drew on various local, state, and federal data sources. Descriptions of each source are listed below.

- **Quarterly Census of Employment and Wages (QCEW)**. Payroll employees and wages, excluding benefits, by industry. Sources include the U.S. Bureau of Labor Statistics and Washington State Employment Security Department.
- **Puget Sound Regional Council (PSRC)**. The PSRC maintains a database of QCEW records for employers with establishments in King, Kitsap, Pierce, and Snohomish Counties. The PSRC conducts a further review of geocoded business establishments to improve accuracy of employment location assignments. Data was collected through several custom data requests to the PSRC, using GIS shapefiles and unified business identification codes, or UBIs, for specific queries of this database. For example, the number of jobs by industry code on Ports of Tacoma and Seattle properties. PSRC data also includes estimated self-employment per industry, in addition to QCEW records.
- **Gross Business Income**. Gross receipts by North American Industry Classification System (NAICS) code reported by the Washington State Department of Revenue.
- **Washington State Input-Output Model**. The Washington State Office of Financial Management publishes a state-specific input-output model designed to reflect the unique dynamics and complexities of the Washington state economy. This model also includes estimated average total compensation per employee per industry sector.
- **Customs Data on Trade Flows**. Data on value and weight of shipments in total and by commodity or merchandise good from the U.S. Census Bureau, reported by port district.
- **Tenant Activities**. Gathered from Port of Seattle, Port of Tacoma, and The Northwest Seaport Alliance staff, including locational data for mapping.
- **Port of Seattle Marine Vessel Customers**. Moorage period and duration by vessel, including commercial fishing vessels and research vessels, provided by the Port of Seattle.
- **PIERS Container Shipments Data**. Provided by the NWSA staff, including TEU breakouts by commodity and origin/destination, including domestic cargo and empty containers.
- **Alaska Licensed Fishing Vessel Data**. Alaska Commercial Fishing Entry Commission licensing data, with detailed information by vessel

for gears and other key attributes per vessel licensed to conduct commercial fishing operations in Alaskan waterways. The Alaska Department of Fish & Game ran custom queries of this database for vessels with reported moorage at Port of Seattle facilities in 2017. Custom aggregations included gross earnings by dollar value and weight (pounds) of harvested biomass in Alaskan waters.

- **Ex-vessel value of catch for fishing vessels**. National Oceanic and Atmospheric Administration data on ex-vessel biomass harvest by weight and dollar value by port.
- **Longshoremen hours**. Published by the Pacific Maritime Association.
- **Port of Seattle Cruise Schedule, Passengers, and Passenger Survey**. The Port of Seattle maintains records for the actual cruise schedule, disembarkments, embarkments, and in-transit stops. Additionally, the Port of Seattle has the projected passenger count and schedule for the 2019 cruise season in Seattle. The Port of Seattle also commissioned a survey of passengers by the McDowell Group in 2017.
- **Reports and studies**. Including those published by the Cruise Line Industry Association and Alaska Seafood Marketing Institute.

Data sources were supplemented by interviews with industry stakeholders and experts, as well as Port of Seattle, Port of Tacoma, and The Northwest Seaport Alliance staff as necessary.

Economic Impact Modeling

Economic impacts include the following components and concepts:

- **Business output**. The economic value of business and operations activities. Similar to business revenues, but also includes the revenue-equivalent value of government operations, such as the revenue contributions of Port of Seattle staff supporting various fishing operations. Business output is the common, accepted term in economic impact modeling.
- **Labor income**. Estimated total compensation earned from employment, inclusive of wages plus additional monetary benefits, such as the value of healthcare insurance.
- **Direct impacts**, representing jobs, income (wages and benefits), and revenues, or output, directly associated with Port of Seattle, Port of Tacoma, and The Northwest Seaport Alliance activities. The definition and measurement of direct activities varies across lines of business, discussed further below. Direct impacts are measured in jobs, labor income, and business output.
- **Indirect impacts**, encapsulating the economic benefit and employment supported through upstream business-to-business transactions and supply chain purchases from supporting industries. Indirect impacts are measured in jobs, labor income, and business output.
- **Induced impacts** are the wider economic benefits supported through the spending of labor income received through the direct and indirect employment on household consumption throughout the broader economy. For example, the spending of earned income among longshoremen on groceries, restaurants, and household goods. Induced impacts are measured in jobs, labor income, and business output.
- **Total economic impacts** refer to the combined impacts of direct, indirect, and induced impacts, measured in jobs, labor income, and business output.
- **Total statewide fiscal impacts** refer to the state-level tax revenues generated through payments of business and occupation, sales and use tax, and other taxes and fees from direct business output and additional state taxes supported through indirect and induced business output.

The Washington State Input-Output Model was used to estimate indirect and induced impacts. This model is published by the Washington State Office of Financial Management every five years, with subsequent annual updates to labor income and industry-specific deflators. The model is built in collaboration across multiple state agencies, leveraging confidential data records, surveys, and the U.S. Benchmark Input-Output Table published by

the U.S. Bureau of Economic Analysis. The intensive use of state-specific industry data improves the model's overall representation of the Washington state economy and the complexities and dynamics unique to Washington state.

Defining Direct Impacts

Each line of business across both Ports entails a specific methodology and definition for direct impacts. These methods and definitions are described below.

Containerized Cargo through The Northwest Seaport Alliance
All activities involved in the direct handling of containerized cargo until after the point where such cargo either leaves the state or is reformatted into a non-marine container. This definition thus includes stevedoring operations and longshoremen; shipping companies; intermodal transportation operations (such as rail); short- and long-haul trucking of marine containers (including drayage); tug services for inbound and outbound container vessels; marine support services; and transloading, warehousing, and logistics operations.

Automobile Shipments through The Northwest Seaport Alliance
All activities engaged in the movement of imported automobiles at the Port of Tacoma. This definition thus includes stevedoring operations and longshoremen; shipping companies; intermodal transportation operations (such as rail); short- and long-haul trucking of marine containers (including drayage); tug services for inbound and outbound car carrier vessels; marine support services; and transloading, warehousing, and logistics operations.

Breakbulk, Logs, and Other Non-Containerized Marine Cargo Under The Northwest Seaport Alliance
Activities involved in the direct handling of breakbulk, logs and lumber, and liquid bulk. This definition thus includes stevedoring operations and longshoremen; shipping companies; intermodal transportation operations (such as rail); short- and long-haul trucking of marine containers (including drayage); tug services for inbound and outbound vessels; marine support services; and transloading, warehousing, and logistics operations. either for import or export, such as longshoremen services, terminal operations, trucking, and warehousing either directly prior to shipment or immediately after arrival.

Port of Seattle Cruise Operations
Cruise ship operations direct impacts are defined as including: 1) estimated cruise ship passenger spending in the region before and after a cruise, such as on local hotels, souvenirs, restaurants, and other goods and services; 2) on-

shore support services, such longshoremen loading and unloading cruise cargo; 3) crew member on-shore spending; and 4) cruise vessel local procurement of provisions, such as food, alcohol, and other purchases.

Port of Seattle Commercial Fishing
Commercial fishing activities include: 1) fishing vessels identified as Port of Seattle customers for moorage and facility services at Fishermen's Terminal, T-91, and the Marine Industrial Center; and 2) on-shore businesses located at Fishermen's Terminal. Any fishing vessel that utilizes Port of Seattle facilities throughout the year is counted as part of direct activities. In some cases, vessels may only utilize these facilities for a short period or only periodically over several years, of which some time in 2017 happened to be one such instance. These vessels, and the economic activities associated with their operations, are still treated as "direct," because access to the Port of Seattle's facilities is viewed as essential to their operations. Similarly, there are some larger fish processor vessels that periodically use T-91 for loading and offloading, but moor off-season primarily at other locations, such as private facilities in Lake Union in Seattle. These vessels are also counted among direct operations because of the essential importance of Port of Seattle facilities to their business as a customer.

Other Port of Seattle Business Including Recreational Marinas
All other Port-based businesses and operations, including tenants, research vessels, barge operations, and activities at the Port of Seattle's recreational marinas. This definition excludes all tenant, tug, and barge activities that are included within the direct activities associated with The Northwest Seaport Alliance marine cargo.

Port of Tacoma Tenants and Other Business
All other Port of Tacoma tenants excluding activities that are directly associated with the marine cargo under The Northwest Seaport Alliance. This category includes Port-based manufacturers, the grain terminal, and other businesses.

THE NORTHWEST SEAPORT ALLIANCE

Economic Value of The Northwest Seaport Alliance Marine Cargo Broken Out by Each Harbor

The economic impacts of the NWSA, Port of Tacoma, and Port of Seattle can be further disaggregated between the two Ports. The Port of Seattle includes commercial fishing, cruise ship operations, recreational marinas and other port business, Sea-Tac International Airport, and the share of the NWSA cargo activities at the North Harbor. The Port of Tacoma includes the NWSA's South Harbor operations and non-NWSA Port of Tacoma tenants and other port business, including the grain terminal and port-based manufacturers.

Exhibit A1 below summarizes the NWSA activities broken out across each harbor.

Exhibit A1. Estimated Direct Impacts of Marine Cargo by Harbor, The Northwest Seaport Alliance, 2017

	Jobs	Business Output (mils 2017 $)	Labor Income (mils 2017 $)
North Harbor	7,160	$2,157.8	$709.3
Containerized Cargo	6,690	$2,036.0	$674.1
Automobiles	0	$0.0	$0.0
Breakbulk, Logs and Other Marine Cargo	470	$121.8	$35.1
South Harbor	12,950	$3,700.9	$1,193.4
Containerized Cargo	8,210	$2,501.6	$828.3
Automobiles	1,330	$308.8	$108.4
Breakbulk, Logs and Other Marine Cargo	3,410	$890.5	$256.8
The NWSA Total	**20,100**	**$5,858.7**	**$1,902.7**

Sources: The Northwest Seaport Alliance, 2018; Port of Seattle, 2018; Port of Tacoma, 2018; Community Attributes Inc., 2019.

Port of Seattle Economic and Fiscal Impacts by Line of Business, 2017 and 2019

Impacts are further disaggregated by each port. **Exhibits A2, A3**, and **A4** report the estimated direct and total economic and fiscal impacts across each lines of business for the Port of Seattle. The economic impacts of Sea-Tac International Airport are also included, along with the projected impacts of cruise ship operations for year 2019 (reported in 2018 dollars). It should also be noted that an estimated 8.6% of air passenger through Sea-Tac International Airport during the cruise season are cruise passengers. In addition to different years, there is some overlap in impacts across these two segments as result in the table below. To account for the overlap between the two lines of business in visitor spending impacts, the direct output impacts of the airport should be reduced by nearly $11.2 billion in direct business output and a total economic impact of $21.9 billion.

Exhibit A2. Estimated Direct Impacts by Lines of Business, Port of Seattle, 2017 and 2019

	Jobs	Business Output (mils)	Labor Income (mils)
The NWSA North Harbor Marine Cargo (2017)	7,160	$2,157.8	$709.3
Sea-Tac International Airport (2017)*	87,300	$11,481.3	$3,650.8
Cruise Industry (2019, 2018$)	3,000	$467.8	$122.7
Commercial Fishing (2017)	7,200	$671.3	$313.4
Recreational Marinas and Other Business (2017)	3,600	$728.8	$357.2

*Note: * Direct impacts of Sea-Tac International Airport are sourced from the Port of Seattle's Sea-Tac International Airport Economic Impacts study, August 2018.*
Source: Community Attributes Inc., 2019.

Exhibit A3. Total Economic Impacts by Line of Business at the Port of Seattle, Washington, 2017 and 2019

	Jobs	Business Output (mils)	Labor Income (mils)
The NWSA North Harbor Marine Cargo (2017)	21,600	$4,605.4	$1,506.3
Sea-Tac International Airport (2017)*	151,400	$22,477.9	$7,099.5
Cruise Industry (2019, 2018$)	5,500	$893.6	$260.1
Commercial Fishing (2017)	11,300	$1,438.0	$543.0
Recreational Marinas and Other Business (2017)	8,800	$1,618.0	$642.0

*Note: * Total economic impacts of Sea-Tac International Airport are sourced from the Port of Seattle's Sea-Tac International Airport Economic Impacts study, August 2018.*
Source: Community Attributes Inc., 2019.

Exhibit A4. Direct and Total Statewide Fiscal Impacts by Line of Business at the Port of Seattle, Washington, 2017 and 2019

	Direct (mils)	Total (mils)
The NWSA North Harbor Marine Cargo (2017)	$33.3	$135.9
Port of Seattle Sea-Tac International Airport (2017)*	$236.3	$415.0
Port of Seattle Cruise Industry (2019, 2018$)	$7.8	$22.9
Port of Seattle Commercial Fishing (2017)	$1.4	$13.2
Port of Seattle Recreational Marinas and Other Business	$8.5	$22.9

*Note: * Direct and total fiscal impacts of Sea-Tac International Airport are sourced from the Port of Seattle's Sea-Tac International Airport Economic Impacts study, August 2018.*
Source: Community Attributes Inc., 2019.

Port of Tacoma Economic and Fiscal Impacts by Line of Business, 2017

Exhibits A5, **A6**, and **A7** report the estimated direct and total economic and fiscal impacts of the Port of Tacoma for each line of business.

Exhibit A5. Estimated Direct Impacts by Line of Business, Port of Tacoma, 2017

	Jobs	Business Output (mils)	Labor Income (mils)
The NWSA South Harbor Marine Cargo	12,950	$3,700.9	$1,193.4
Port of Tacoma Tenants and Other Business	1,500	$852.2	$114.3
Port of Tacoma Total	**14,450**	**$4,553.1**	**$1,307.8**

Source: Community Attributes Inc., 2019.

Exhibit A6. Total Economic Impacts by Line of Business, Port of Tacoma, 2017

	Jobs	Business Output (mils)	Labor Income (mils)
The NWSA South Harbor Marine Cargo	36,900	$7,780.0	$2,512.2
Port of Tacoma Tenants and Other Business	5,200	$1,551.7	$326.9
Port of Tacoma Total	**42,100**	**$9,331.8**	**$2,839.1**

Source: Community Attributes Inc., 2019.

Exhibit A7. Direct and Total Statewide Fiscal Impacts by Line of Business at the Port of Tacoma, Washington, 2017

	Direct (mils)	Total (mils)
The NWSA South Harbor Marine Cargo	$21.4	$85.4
Port of Tacoma Tenants and Other Business	$5.3	$15.4
Port of Tacoma Total	**$26.6**	**$100.8**

Source: Community Attributes Inc., 2019.

Annual Income Comparisons by Line of Business and Segment

Total annual average direct income for each line of business is presented **Exhibit A8**. Containerized cargo employment, on average, provides the highest annual compensation among all lines of business and segments across both Ports and The Northwest Seaport Alliance. The overall average estimated annual total compensation for the NWSA was $94,700 for 2017. The Port of Seattle cruise average labor income estimates are included in **Exhibit A8**, but represent projected incomes for 2019, reported in 2018 dollars, so are not directly comparable to other segments shown.

Exhibit A8. Average Annual Labor Income by Line of Business and Segment, Port of Seattle, Port of Tacoma, and The Northwest Seaport Alliance, Washington, 2017 and 2019

	Average Income
The Northwest Seaport Alliance (2017)	$94,662
Containerized Cargo	$100,837
Automobiles	$83,355
Breakbulk, Logs and Other Cargo	$74,840
Port of Seattle Sea-Tac International Airport (2017)*	$41,819
Port of Seattle Cruise Industry (2019, 2018$)	$40,899
Port of Seattle Commercial Fishing (2017)	$43,524
Port of Seattle Recreational Marinas and Other Business (2017)	$99,217
Port of Tacoma Tenants and Other Business (2017)	$76,225

*Note: * Average income of Sea-Tac International Airport are sourced from the Port of Seattle's Sea-Tac International Airport Economic Impacts study, August 2018.*
Source: Community Attributes Inc., 2019.