ADVANCE ASTORIA:

ECONOMIC OPPORTUNITIES ANALYSIS FOR THE FIVE-YEAR ECONOMIC DEVELOPMENT STRATEGIC PLAN

INTERIM DISCUSSION DRAFT - 3/3/2017

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EXECUTIVE SUMMARY

KEY FINDINGS

This document evaluates economic and economic development trends across a variety of scales to inform a forecast-based estimate of the demand for developable and redevelopable sites in Astoria, Oregon. This estimate of demand is compared with an estimate of the supply of these sites based on the City of Astoria and Clatsop County's inventory of parcels. The following are key findings from the analysis.

Global Trends: after the recession in 2009, the world economy has rebounded unevenly, with robust centers of growth emerging in Asian markets. China's growth, which has paced the planet for the last several years, is slowing, and the potential for a new wave of protectionist policies adds to an uncertain future for trade, especially in domestic regional economies that trade extensively with China and other Asian countries. China accounts for the vast majority of Port of Astoria exports.

National Trends: the U.S. economy has generally improved since the recession, with decreased unemployment and increased real GDP. However, wages have been stagnant.

Regional Trends: Northwest Oregon, like much of the Pacific Northwest, is experiencing a prolonged decline in resource-based employment. Some of these industries, such as seafood processing, are likely to maintain a strong presence in Astoria into the futre, while others may subside. New economic drivers will emerge, especially as a result of cross-pollination from larger metros like Portland.

Local Trends: the largest industry in Astoria, by far, is educational services, health care and social assistance. These typically pay good wages, and Astoria also benefits from relatively high levels of educational attainment. Nevertheless, anecdotal evidence suggests that housing affordability is a key issue.

Land Supply and Demand: the forecast indicates that employment in Astoria will grow by about 1% annually, adding about 1,400 net new jobs by 2040. This could require about 125 acres of of developable and redevelopable land in Astoria. This study suggests that Astoria currently has enough land to meet this need.

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1 COMMUNITY PERSPECTIVES ON GROWTH

This section of the Economic Opportunities Analysis presents an overview of the community and stakeholder engagement process utilized in the drafting of this document. Several outreach methods were employed, and hundreds of residents, business owners and others participated. The findings from this process add context to the data provided in subsequent sections of the EOA and give direction for the development of the City of Astoria's economic development agenda.

The City employed multiple engagement methods in order to capture a significant number and wide variety of respondents and to ensure that all perspectives were represented. Thiese methods included the following:

- The creation of the Advance Party, a technical advisory panel that meets periodically, reviews and advises on work products, represents critical industries and works to engage the broader public.
- The hosting of two community forums to disseminate project information and technical data to stakeholders and to obtain feedback from members of the community. Though the forums are primarily intended to convey information about the project to the community, comments have been encouraged and accepted and intergrated into the data profile.
- Panel discussions featuring a diverse array of business and industry leaders have been scheduled to follow select forums and Advance Party meetings. The public is invited to attend these discussions, which

generate interest in the project and provide insight into economic development challenges, as well as innovative solutions to these challenges, from other locations in the region.

- A survey has been widely distributed and promoted at the community forums. This survey has resulted in more than 80 individual responses to 13 unique questions about economic development challenges and opportunities in Astoria, and the results will be leveraged for the development of strategic priorities and tailored actions.

- A pop-up display has been developed and deployed at a variety of community events and meetings to engage people who are not interested or able to attend the community forums and other activities. This display is graphically appeal and features a "postcard from the future", where participants write a postcard to describe the types of improvements that have occured in Astoria at a specified time in the coming years.

- A series of five intensive focus groups were conducted with small groups of industry representatives to understand the factors affecting known industry clusters in Astoria. These focus groups included up to eight participants and focused on industry-specific challenges and opportunities, with direct relevance to economic development strategy. Several follow-up interviews were conducted to supplement focus group participation.

All of these activities have resulted in feedback that is broadly representative and informative for the City and the project team.

SUMMARY OF FINDINGS

Several themes emerged from the engagement process, and while those themes were largely consistent between engagement activities, each activities generated unique ideas about what Astoria is good at, challenged by and would benefit from. Key findings from the survey and the focus groups are repesented below.

SURVEY FINDINGS

- Local business owners and residents were heavily represented in the responses, but perspectives from Warrenton, rural Clatsop County, Portland and elsewhere were included. Business owners who participated largely operated in retail or small-scale manufacturing

- Labor force availability and preparation ranked as the second most significant barrier to opening or expanding a business in Astoria and the highest ranked economic development challenge

- Respondents also highlighted a lack of land for new development and a lack of available commercial space as an impediment to opening or expanding a business

- The highest ranking economic development opportunities were also related to labor: rethinking workforce training programs and creating new jobs through expanded partnerships between businesses, institutions and government

- The survey results demonstrated huge support for expansion of industries related to research and development, education, medicine and health care, and light manufacturing (especially via value-added production)
- The results also demonstrated good support for craft brewing and fermentation industries, as well as microenterprise
- There was significant support via write-in responses for tourism-related industries, resource-based industries, especially including logging, commercial fishing and processing, and agriculture, and technology and related services, such as software and web development, which may include workers who telecommute to jobs in other cities
- The survey results indicate that large investments from the City should focus on business recruitment, retention and expansion for businesses that fit Astoria's needs
- Several specific proposals were included in one survey question, and the highest ranked priorities were expansion of the "Extreme Makeover" storefront improvement program, establishing a business incubator for small businesses, and creating a "one-stop-shop" for information for business owners at the City

FOCUS GROUP FINDINGS

The following is a summary of comments from focus group participants. These comments reflect the views and opinions of the participants and will inform, but not direct, the development of economic development strategies.

Research and Development, Medicine and Education

Industry Prospects

- There is a lot of interest in sustaining natural runs of salmon in the Columbia River; science will continue to play a strong role in the economy here around sustaining viable fish populations
- Our education and medicine cluster needs to be supporting the other clusters in town
- OSU Extension could be an asset for these industries in Astoria, offering innovative nutrition and fermentation science programs
- Housing in Astoria is a huge barrier to attracting and maintaining professional caliber talent
- There may be an opportunity for the landlords' association to have a relationship with the hospital, OSU extension or other employers to provide contract housing for employees
- Health care and education represent critical services to residents, in addition to offering good jobs, making them an important component of Astoria's livability

Microenterprise & Entrepreneurship

- Astoria is at a crossroads now for what it will become; it's never good if it's just tourism, and Astoria's entrepreneurs and telecommuting workers from other cities inject some diversity
- Home-based business licensing process could be a major obstacle for entrepreneurs locating here
- As businesses scale up, it is extremely difficult to find available and ffordable commercial space
- There seems to be a lot of turnover and high failure rates with small businesses downtown; perhaps some sort of testing ground (e.g. a maker space), programs or city-sponsored or supported business training could improve the prospects for entrepreneurs
- The Astoria Sunday Market is a vital resource

Craft Brewing & Fermentation

- The breweries and other related businesses can contribute to the City's brand, and the City should work to strategically support what the brand is; what's critical is an evolving attitude about the City's identity, which is no longer fixed to timber and canning
- Mixed-use zoning is critical, as is flexible use interpretation, for businesses in this industry because it often straddles the divide between retail and industry; the City has been good to work with and very flexible
- Finding houseing for new employees is a very significant challenge
- Tourism is essential for retailers, and probably is inevitable as well, but we don't want to become a monoculture of tourism; we want to be a good place to live that serves residents well
- Livability is critical; as an example, recreational uses of forest lands should factor into an economic development strategy – this could be a world-class mountain biking town, but the forests have mostly been let go to motorized users

Non-Profit / Philanthropy

- Living wage jobs are the number one need in the area; there has been a lot of economic development, but not much of it provides living wages
- Housing is a major challenge; ADUs, DADUs, tiny homes, mixed-use residential, increased multifamily densities and other solutions must be looked at
- Construction costs contribute to a lack of housing development and developers of affordable housing pay more than private sector developers due to increased regulation
- This study should leverage other ongoing programs: ADHDA is doing a cluster analysis to

understand what businesses anchor industry clusters here and where clusters would like to see businesses come in

- Reliable, high-speed internet is a need for local businesses

Food and Food Production

- parking is a challenge during high season, and our business relies on easy park and foot traffic; there are dead blocks downtown that could be used for a parking structure, which could be a great investment
- The tourism industry is critical for restaurants and other businesses in this industry; during three months of the year we make 70% of our annual revenue
- Increasing the number of festivals and events would drive traffic to food establishments and other retailers
- Astoria has been good to work with (and better than other cities in northwest Oregon) when going through the process of opening a business
- Embracing Astoria's historical significance should be a component of an economic development strategy

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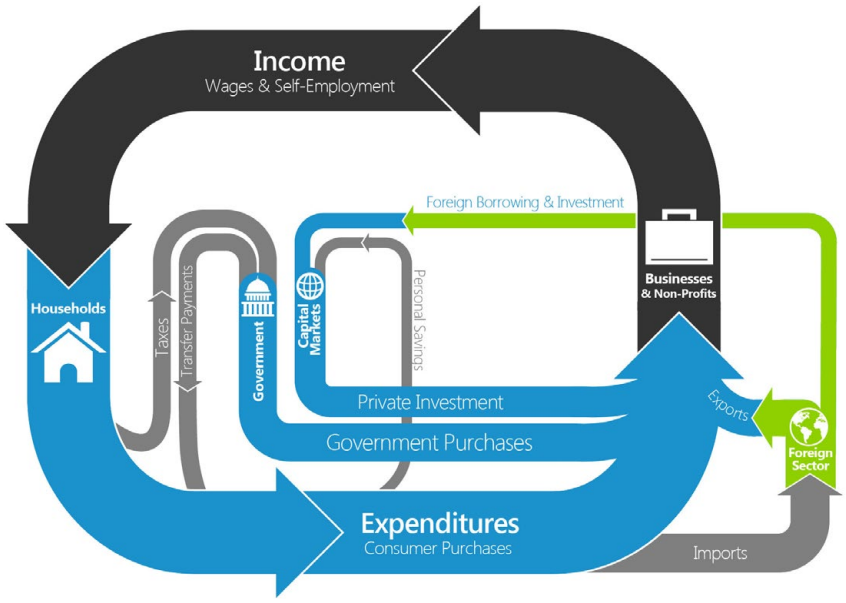
2 ECONOMIC DEVELOPMENT TRENDS

This section of the Economic Opportunities Analysis evaluates data across multiple scales to identify and assess global, national, regional and local trends in economics and economic development. These trends are informed by local perspectives and community input and in turn they suggest strategies that can accomplish broader community objectives.

The data presented here offer measures of growth (e.g. gross domestic product, employment, investment, exports, population), measures of prosperity (e.g. productivity, income) and measures of economic inclusion (e.g. wages). The image below depicts the relationships between some of these metrics and is instructive in how local, regional and national economies function together.



GLOBAL TRENDS

Global economic trends set the context in which the U.S. national economy operates. In the Pacific Northwest, in particular, global trade and trade relationships with Asian countries are tremendously important to local and regional economic growth.

Figure 1.1 shows that global trade fell 11.4% in 2015, which was the first year-over-year decline since 2009, when a global recession was accompanied by a decline in overall global trade of 20.4%. Much of the decline was due to lower trade in merchandise while the trade in services has been reasonably consistent over the past four years. Trade is important to national economies because it generates revenue, encourages specialization and spurs job creation. Most economists believe that countries that trade more also enjoy paths to higher economic growth, but growth is a broader metric and national economies can grow even when trade falters.

FIGURE 1.1 GLOBAL TRADE IN SERVICES AND MERCHANDISE
All Countries, 2005 – 2015 | World Trade Organization (2016)

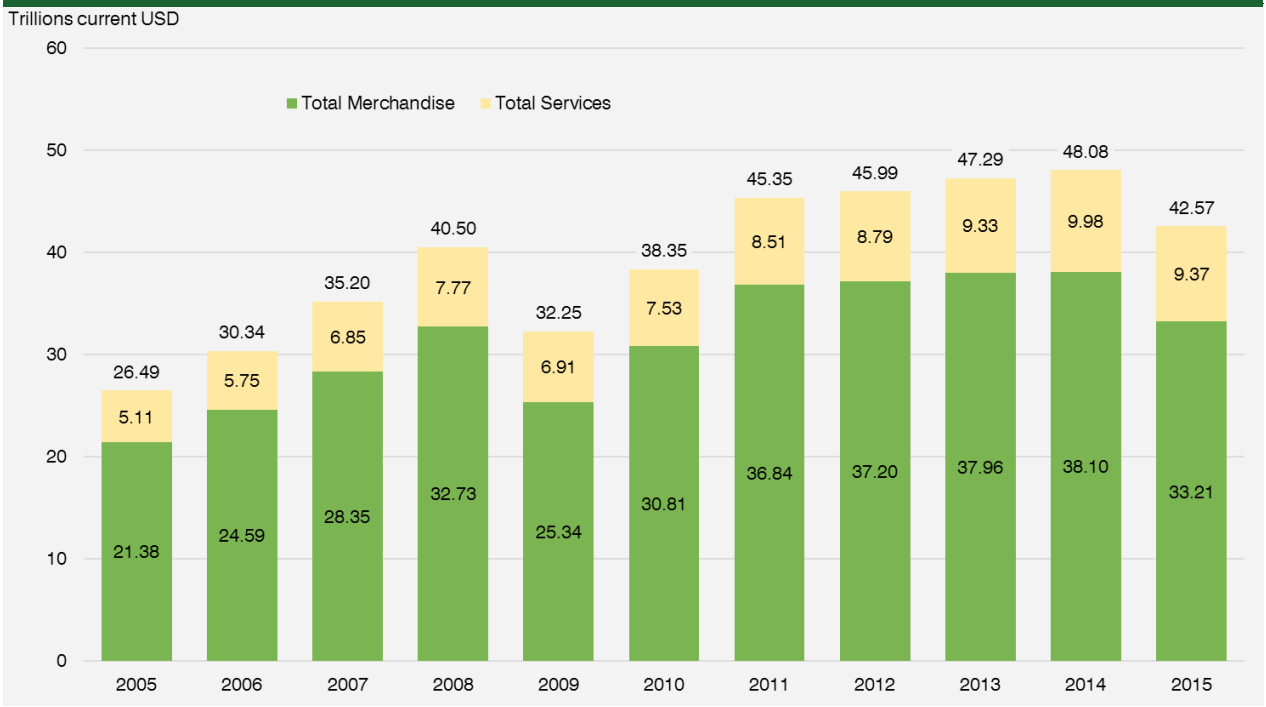


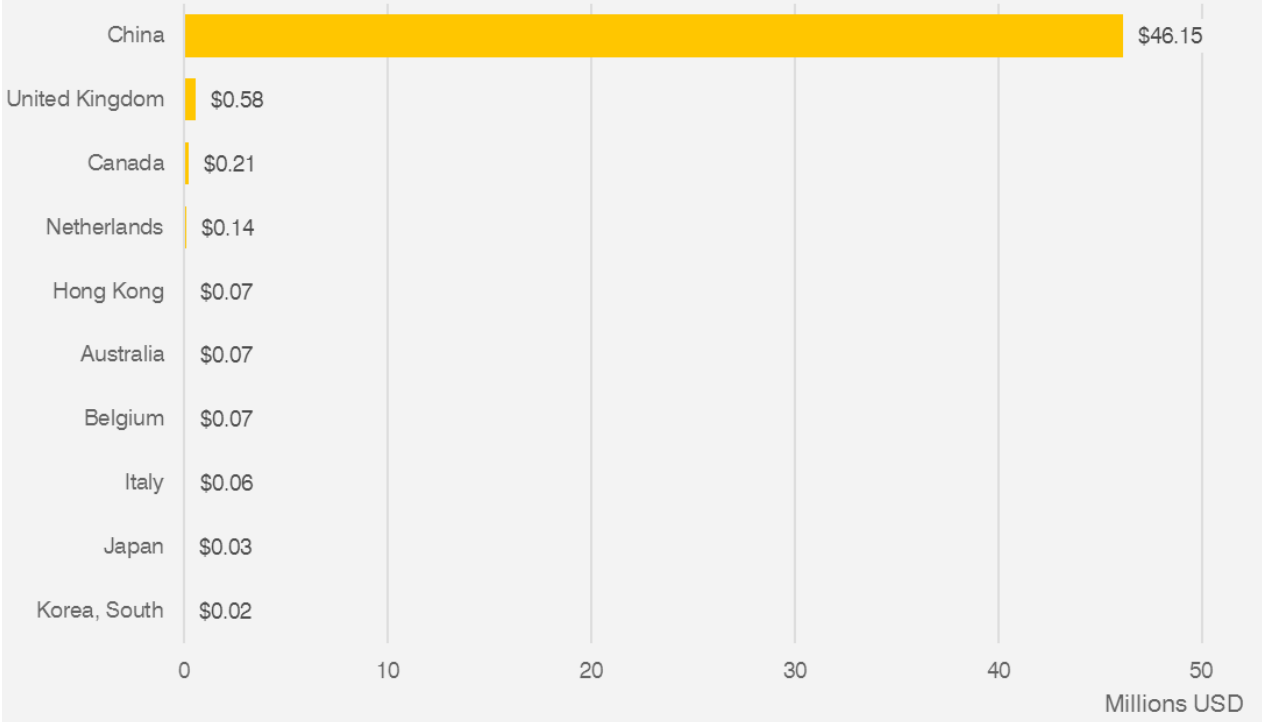
Figure 1.2 illustrates the growth of the global economy, as well as clusters of national economies. Major advanced economies tend to grow more slowly, while emerging and developing economies in Europe and Asia grow more rapidly. Taken together, the global economy grew rapidly coming out of the recession in 2009, and that growth has levelled off in recent years to between 3% and 4%.

Emerging and developing Asian economies experienced particularly robust growth, having averaged between 6% and 10% annually for almost two decades. Asia will continue to emerge as the largest source of economic growth globally, with China displacing the U.S. as the largest economy in the world within the next two decades (or sooner). China and Japan already constitute the 2nd and 3rd largest economies in the world. India—which has the seventh largest economy in the world—is expected to grow in real terms between 7.5% and 7.8% per year between now and 2021 .

FIGURE 1.2 OBSERVED ANNUAL GLOBAL GROWTH
All Countries, 2000 – 2016 | International Monetary Fund

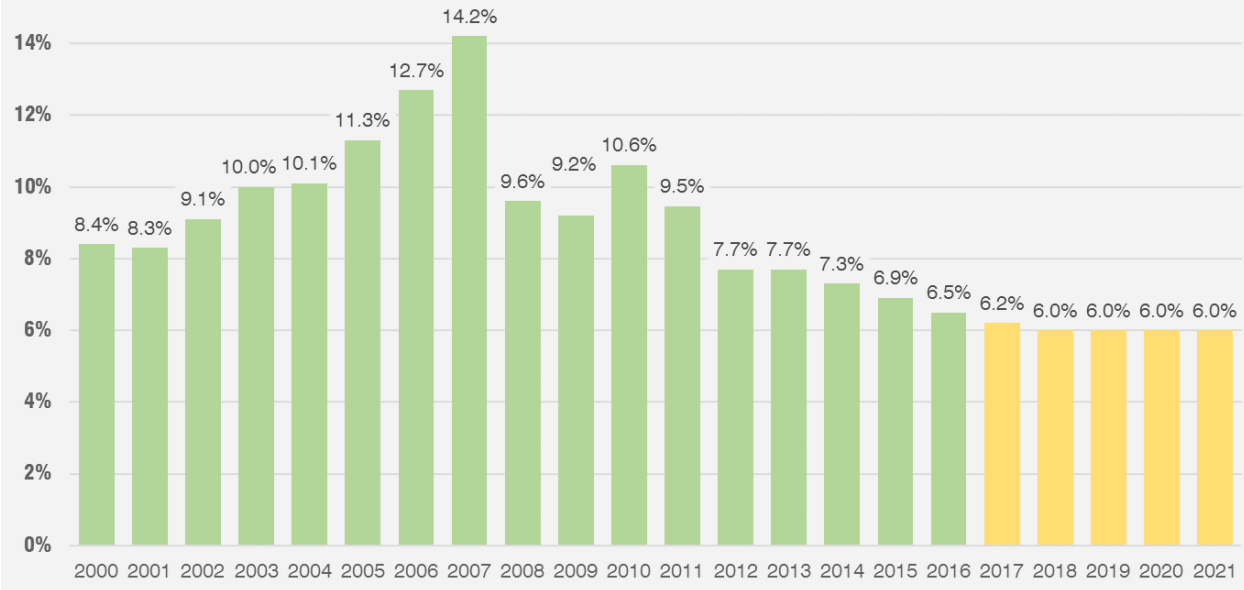
Given the Pacific Northwest's trade relationships in Asia, as well as Asia's strong contribution to global growth, the performance of key national economies on that continent will continue to be important factors for regional economies in the U.S. **Figure 1.4** shows that China's economy, which grew at a rate faster than 9% every year between 2002 and 2011, is beginning to slow down. Economic projections suggest that Chinese economic growth will flatten to an annualized rate of 6% in the coming years. Part of this decline can be attributed to the readjustment of the Chinese economy towards domestic consumption and away from investment (gross capital formation). Despite an overall decline, exports to China could still increase in the years ahead as household consumption increases as a share of GDP. China is currently the predominant recipient of exports from the Port of Astoria (**Figure 1.3**), and a growing Chinese middle class will increasingly demand high value foods, including seafood sourced in U.S. waters, which could present more export opportunities for Oregon-based commercial fishing and seafood processing industries.

FIGURE 1.3 EXPORTS BY DESTINATION
Port of Astoria, 2016 | U.S. Census Bureau – USA Trade (2015)



However, China may need to address a new wave of insolvent credit among state enterprises, which could potentially hamper future economic growth. Furthermore, a global trend toward populism may hinder further free trade deals. The Trans-Pacific Partnership (TPP) would have potentially increased local exports to Japan and Vietnam, but the trade deal is no longer expected to be passed by the new Congress.

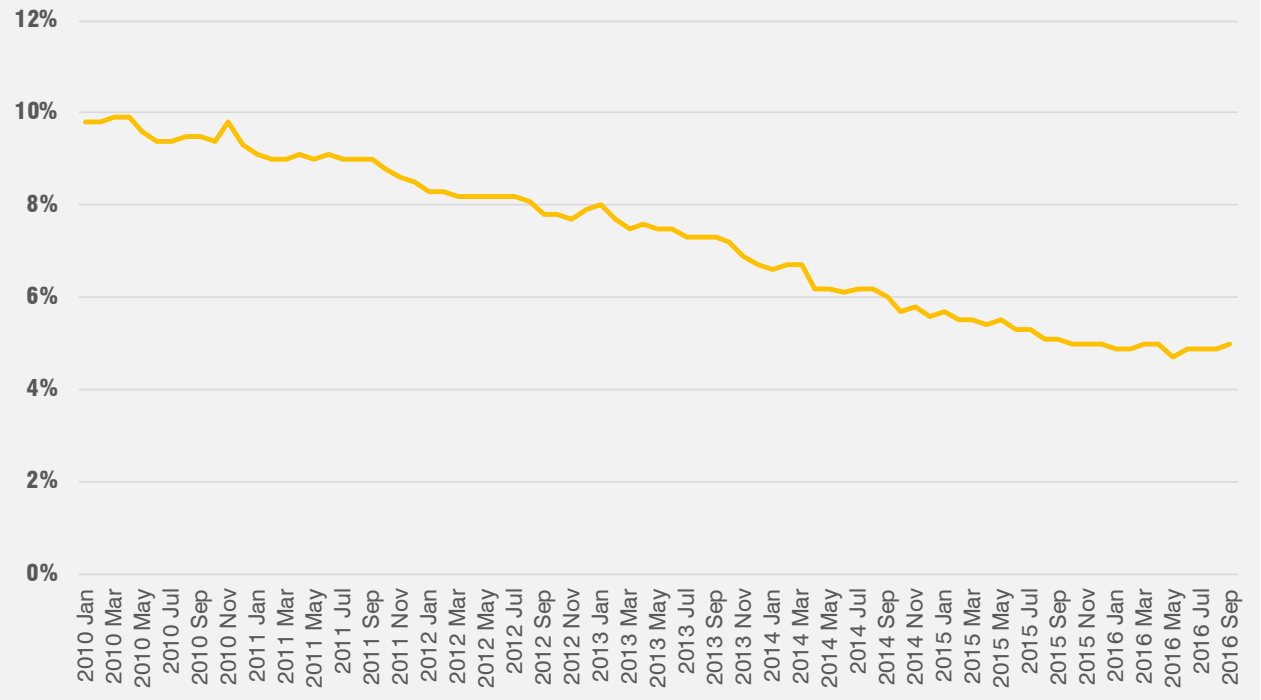
FIGURE 1.4 OBSERVED AND PROJECTED ANNUAL GROWTH
China, 2000 – 2021 | International Monetary Fund (2016)



NATIONAL TRENDS

The U.S. economy has rebounded from the Great Recession and most economic metrics reflect this strong position. U.S. unemployment has fallen from nearly 10% at the beginning of 2010 to about 5% in Q3 2016 (**Figure 2.1**).

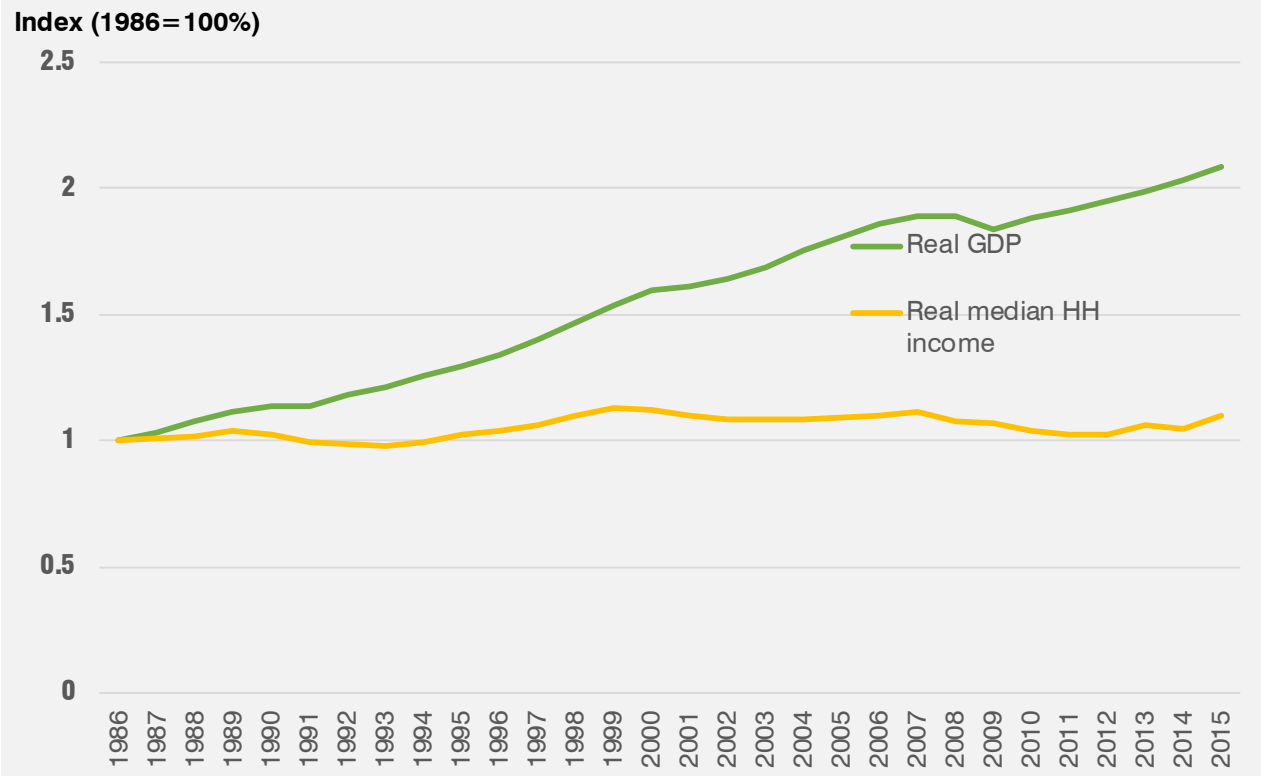
2.1 QUARTERLY UNEMPLOYMENT RATE
United States, 2010 – 2016 | U.S. Bureau of Labor Statistics (2017)



Despite increasing employment, real median household income has not grown significantly for decades. Despite strong growth in real median household income in 2015, the metric still shows incomes lagging relative to their peak in 1999. Furthermore, growth only in one income segment (e.g. high-earning households) can shift the median household income significantly. This increases the importance of local wage data, as well as local conversations on income and wage equality and cost-of-living.

2.2 MEDIAN HOUSEHOLD INCOME VS REAL GDP

United States, 1986-2015 | U.S. Bureau of Economic Analysis (2017)



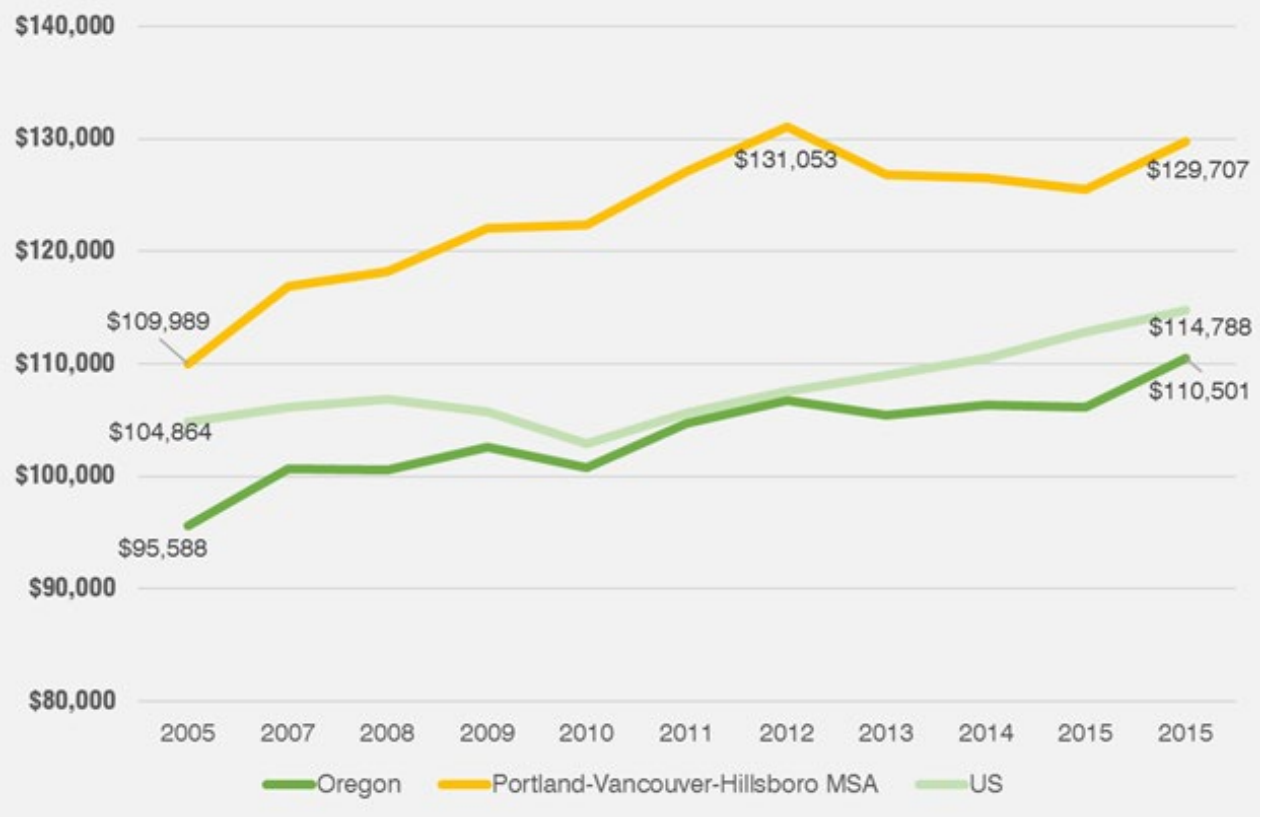
A lack of growth in real median household incomes exists despite long-term gains in real GDP per capita, which is a proxy for worker productivity (**Figure 2.3**). When productivity increases faster than median incomes, this can indicate increasing inequality. However, since 2012 the growth in real GDP per capita has been somewhat anemic. Weak growth in productivity could further hamper growth in real median household incomes. However, the concurrent rebound in productivity and uptick in real median household income from 2015-2016 offers improved prospects for workers' pay.

There are several other micro-trends that underpin these macroeconomic observations. For example, entrepreneurship is taking new forms and increasing in popularity. Many individuals now choose to record their earnings via the IRS 1099 process and as a result do not appear in employment or unemployment statistics, but nevertheless contribute to local and regional economic growth. These individuals exist in most industries and have powered an apparent resurgence in DIY-inspired, "maker" culture. Though some of these individuals maintain full-time employment elsewhere while pursuing entrepreneurial projects on a part-time basis, these efforts, when successful, have the potential to grow into larger companies that employ local workers.

Data from Economic Modeling Specialists International (EMSI) indicate that as of 2012 there are almost 11 million self-employed people in the US, which represents a 14.4% increase from 2001. In Oregon, an estimated 9% of all workers are considered to be self-employed. Many of these workers have needs that are not met through the traditional job markets. They often desire cost-effective, shared- or cooperatively-owned office space, equipment and other just-in-time services that provide efficiency and flexibility. The rise of incubators, "makers" spaces, co-working labs and tool libraries are evidence of these preferences. Cities that want to encourage independent entrepreneurs can explore innovative means of delivering these resources.

2.3 REAL GDP PER CAPITA

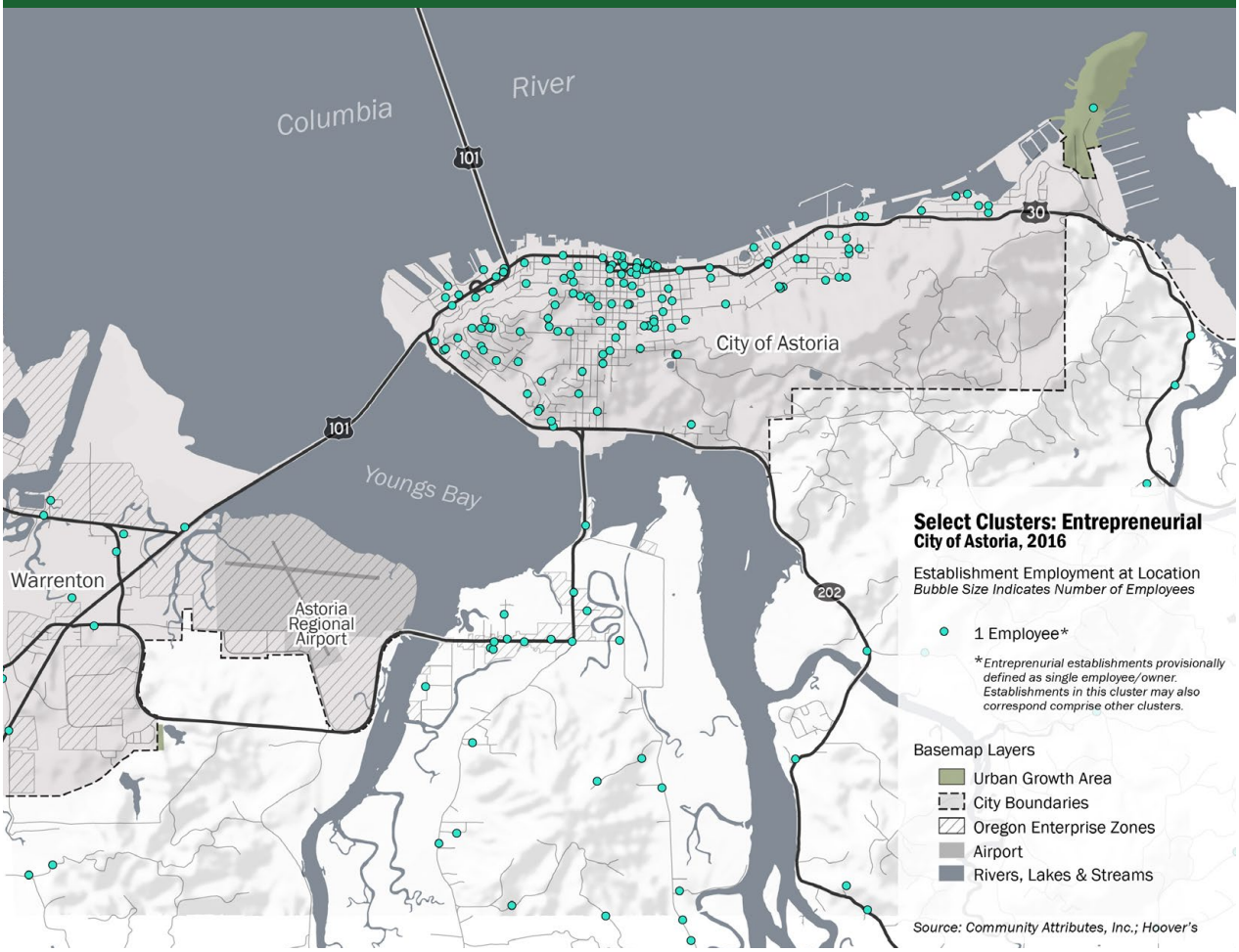
United States, 2005-2015 | U.S. Bureau of Economic Analysis (2017); U.S. Bureau of Labor Statistics (2017)



Astoria's entrepreneurial economy is illustrated in **Figure 2.4**. There are 139 identified entrepreneurial establishments in Astoria. They report average revenues of about $70,000 annually for a total of more than $9.5M in 2015, and on average they occupy less than 1,800 square feet of space to operate, which means that the entire sector leases nearly 250,000 square feet of space within the City. There may be opportunities to improve the provision of resources for these and other entrepreneurs as an avenue for current and future economic development. This model is consistent with an economic gardening philosophy, and may be a good fit for Astoria.

One of the core services that governments can provide to entrepreneurs and established business owners alike is infrastructure. Quality infrastructure improves the odds that companies will find a development site attractive, hence offering a valuable economic development tool. Other forms of infrastructure, such as high-speed internet, are becoming increasingly important, however, as employees place a stronger emphasis on living in places that offer a high quality of life which sometimes includes telecommuting to jobs in other cities. In this way, economic development in the United States today is less about site-selection and deal-making than it has been in the past, and is increasingly about cultivating a pool of educated and talented workers, clean, safe and enjoyable community and responsive local government.

2.4 ENTREPRENEURIAL CLUSTERS
City of Astoria, 2016 | Hoover's; Community Attributes Inc.

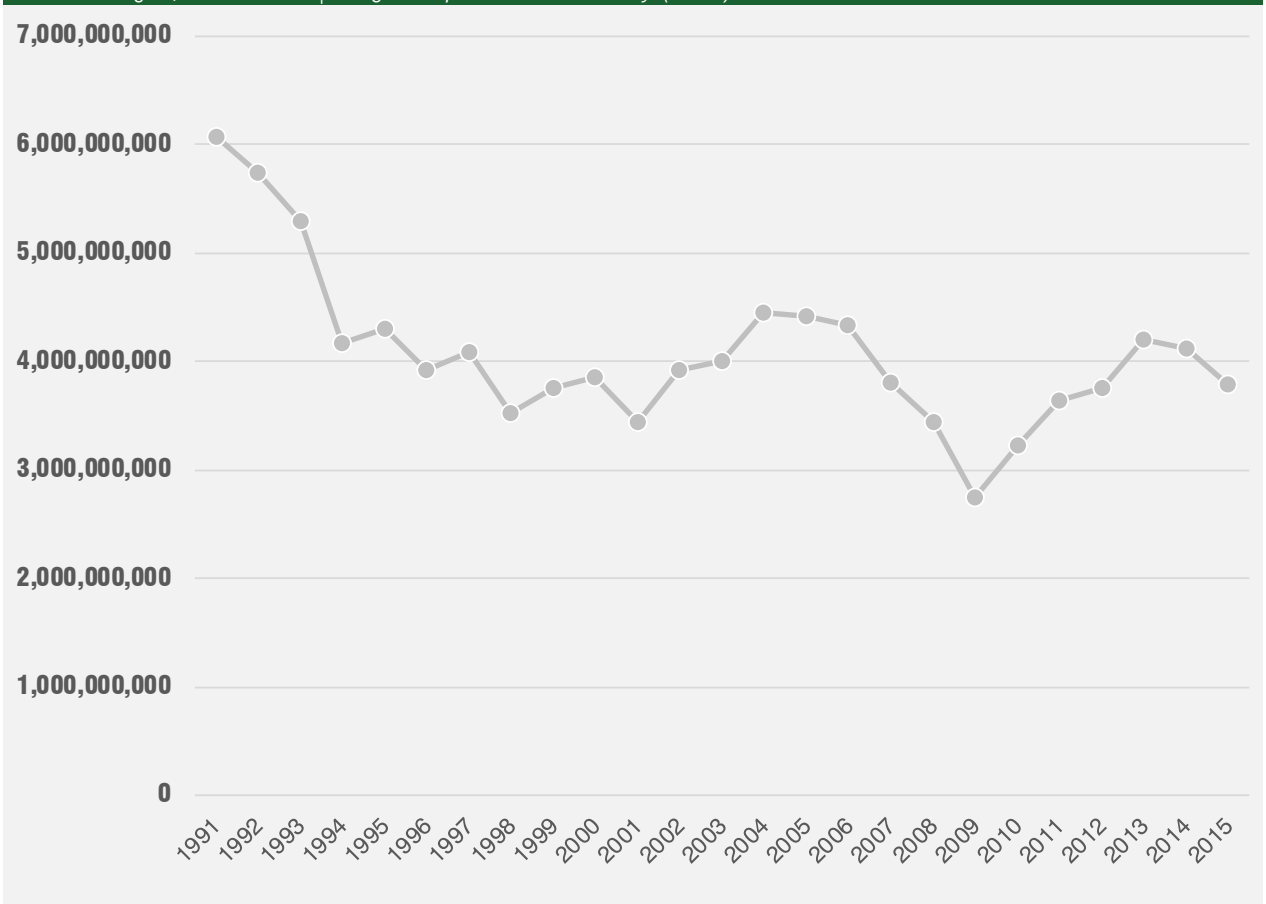


REGIONAL TRENDS

The economies of the Pacific Northwest have traditionally been dependent on natural resources. Forestry and commercial fishing, in particular, have historically been powerful forces for local and regional economic growth. In Oregon and other areas throughout the Pacific Northwest, these industries are changing and new paths of growth are emerging.

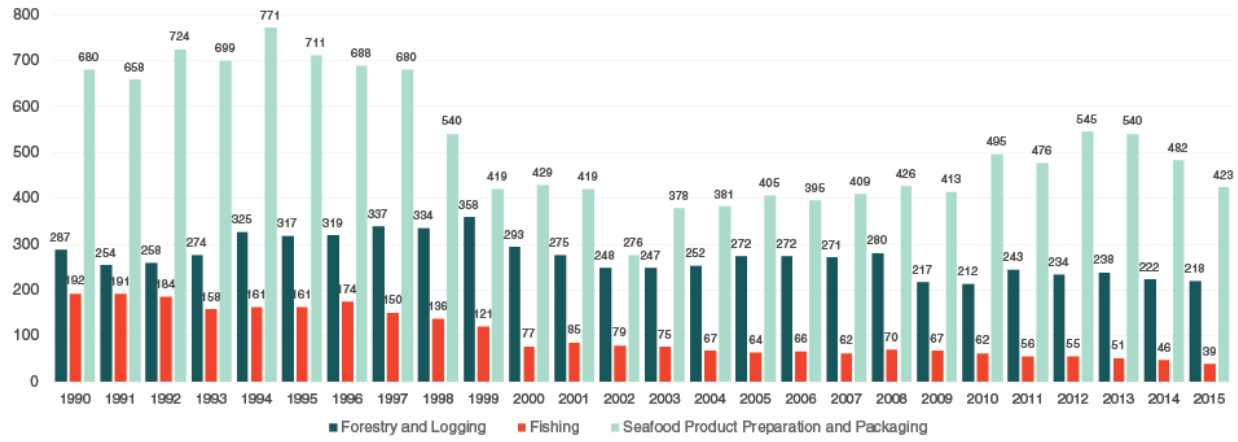
Forestry offers a salient example. The timber industry in the Pacific Northwest, generally, and in State of Oregon specifically, has decreased in prominence over the previous decades (**Figure 3.1**). Several factors, including the listing of the Spotted Owl as an endangered species in 1990 and the adoption of the Northwest Forest Plan (NWFP) in 1994 curtailed production. While some forestry-dependent economies are still seeking economic resiliency, others have diversified or are investigating new products, such as cross-laminated timber (CLT), to reinvigorate the industry. Notably, employment in forestry and logging in Clatsop County has remained relatively steady since 1990 (**Figure 3.2**), despite the statewide decline.

FIGURE 3.1 ANNUAL TIMBER HARVEST IN BOARD FEET
State of Oregon, 1991-2015 | Oregon Department of Forestry (2016)



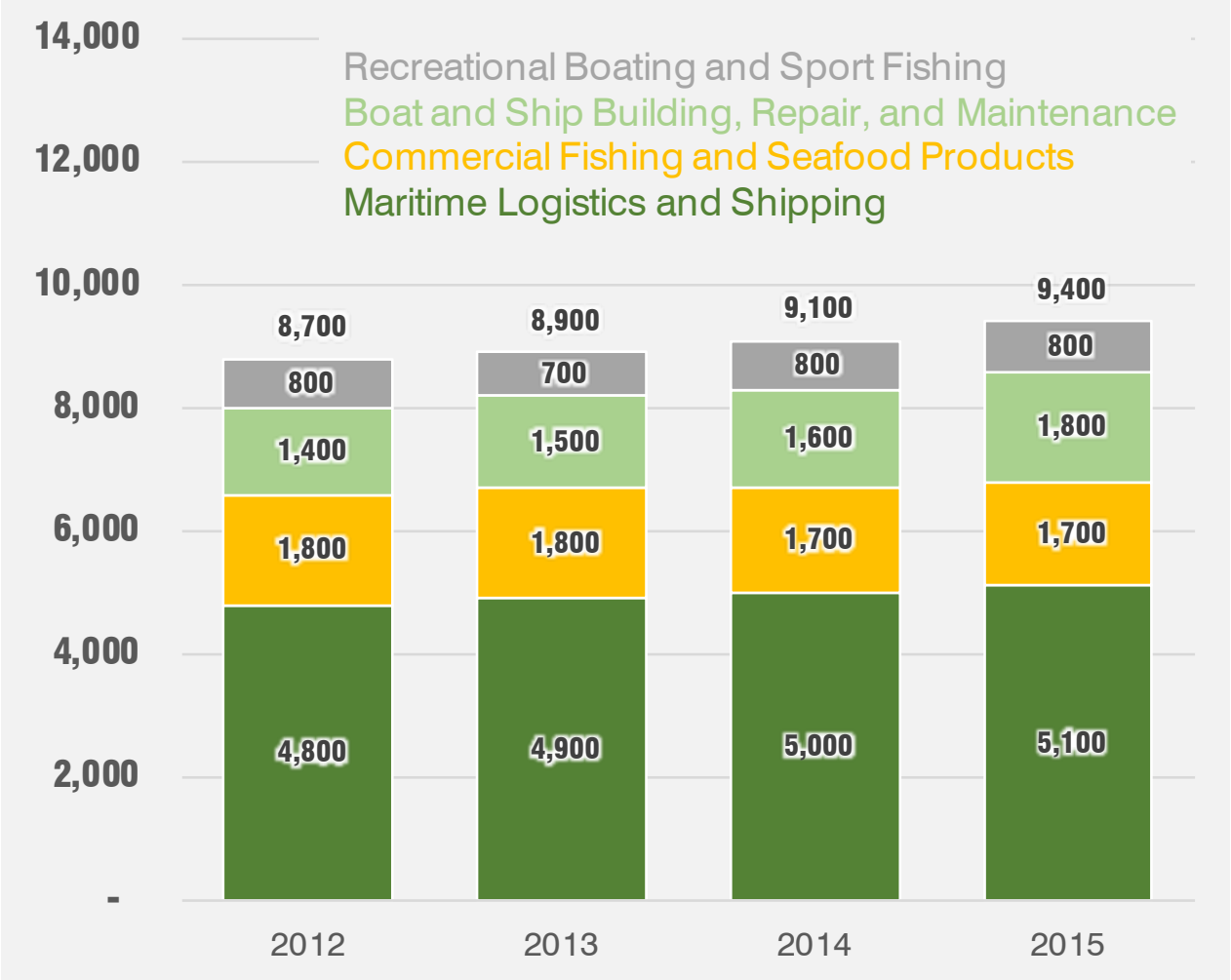
Commercial fishing and other maritime activities are economic engines up and down the Pacific coast. Employment in Oregon's maritime sectors has increased in recent years—from about 8,700 jobs to about 9,400, but certain sub-sectors—such as recreational boating and sport fishing and commercial fishing and seafood products—have remained steady or have shrunk (**Figure 3.3**).

FIGURE 3.2 HISTORICAL EMPLOYMENT IN RESOURCE-RELATED INDUSTRIES
Clatsop County, 1990-2015 | U.S. Bureau of Labor Statistics QCEW



Source: Community Attributes, State of Oregon, Quarterly Census of Employment and Wages (QCEW)

FIGURE 3.3 MARITIME-RELATED EMPLOYMENT BY SECTOR
State of Oregon, 2012-2015 | U.S. Bureau of Labor Statistics (2016)

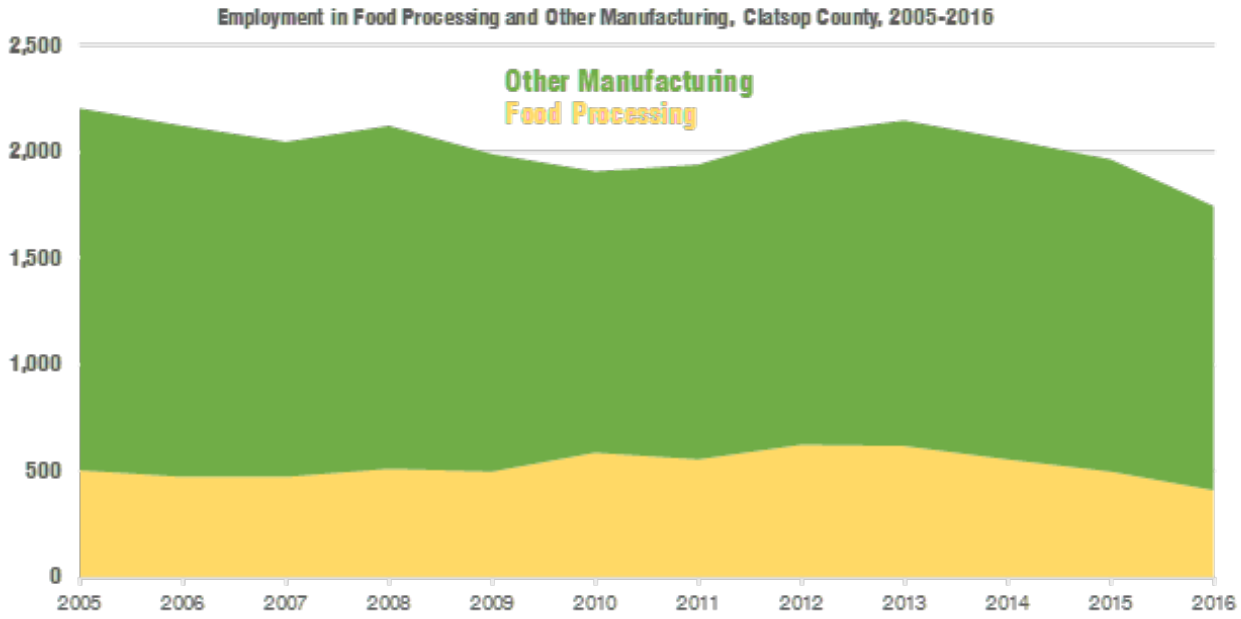


In Clatsop County, specifically, food processing (NAICS 311), which houses some companies doing business in the commercial fishing and seafood products sector in **Figure 3.4**, also accounts for a smaller portion of manufacturing jobs now than in 2010, and has lost 175 jobs in the past five years.

Though food processing is a subset of the manufacturing sector, it has historically been an important source of employment for Astoria. As maritime-related employment waxes and wanes locally, the composition of manufacturing jobs is likely to change as well. A prolonged decline in industries such as food processing would potentially require creative planning for the future of manufacturing and industry in Clatsop County.

FIGURE 3.4 EMPLOYMENT IN FOOD PROCESSING AND OTHER MANUFACTURING
Clatsop County, Oregon, 2005-2016 | Oregon Department of Employment (2016)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Food Processing	506	477	475	510	499	587	553	628	617	555	496	412
Other Manufacturing	1,698	1,644	1,574	1,613	1,493	1,321	1,386	1,455	1,532	1,507	1,468	1,330
Total - ALL Manufacturing	2,204	2,121	2,049	2,123	1,992	1,908	1,939	2,083	2,149	2,062	1,966	1,742
Percent - Food Processing	23.0%	22.5%	23.2%	24.0%	25.1%	30.8%	28.5%	30.1%	28.7%	26.9%	25.3%	23.7%

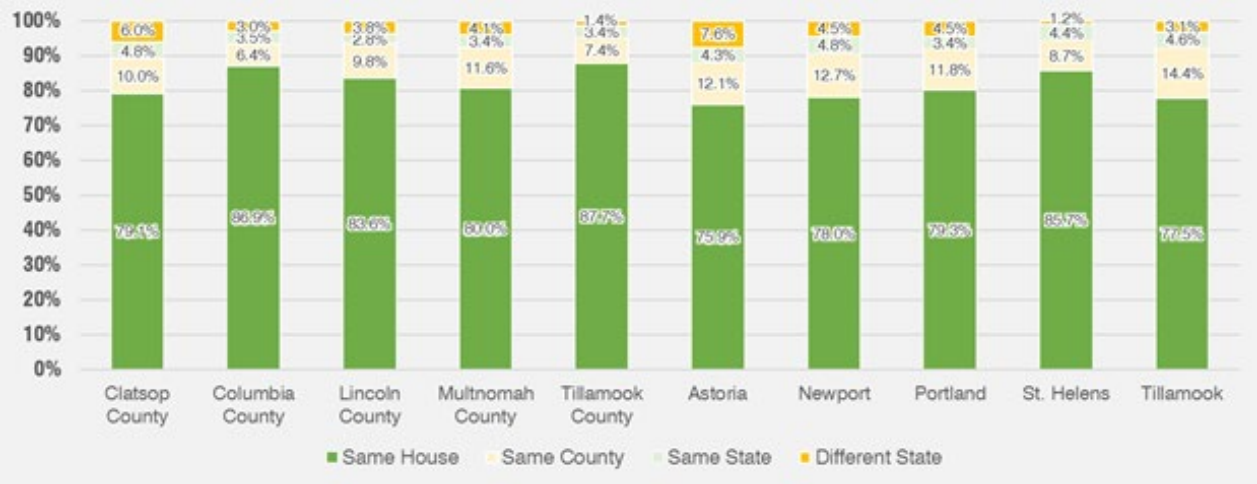


Even if commercial fishing, food processing and other resource-related drivers of local industry maintain their current levels of employment or grow in the coming years, the regional economy of Northwest Oregon and Clatsop County is likely to continue to experience some restructuring as new economic drivers emerge.

Increasing mobility for residents and workers improves the cross-pollination of economies and can create opportunities for these new drivers to emerge. Anecdotal evidence suggests a strong presence of recently-relocated residents in Astoria and Clatsop County, some of whom bring new ideas and open new businesses or bring new skills and empower existing firms. The data in Figure 3.4 validates the anecdotal evidence, showing that Astoria and Clatsop County had relatively few residents living in their same home one year ago. In Astoria, nearly 12% of all residents lived outside Clatsop County or outside the State of Oregon 12-months prior.

FIGURE 3.5 RESIDENCE ONE YEAR AGO

Selected Comparison Geographies, 2015 | U.S. Census Bureau American Community Survey

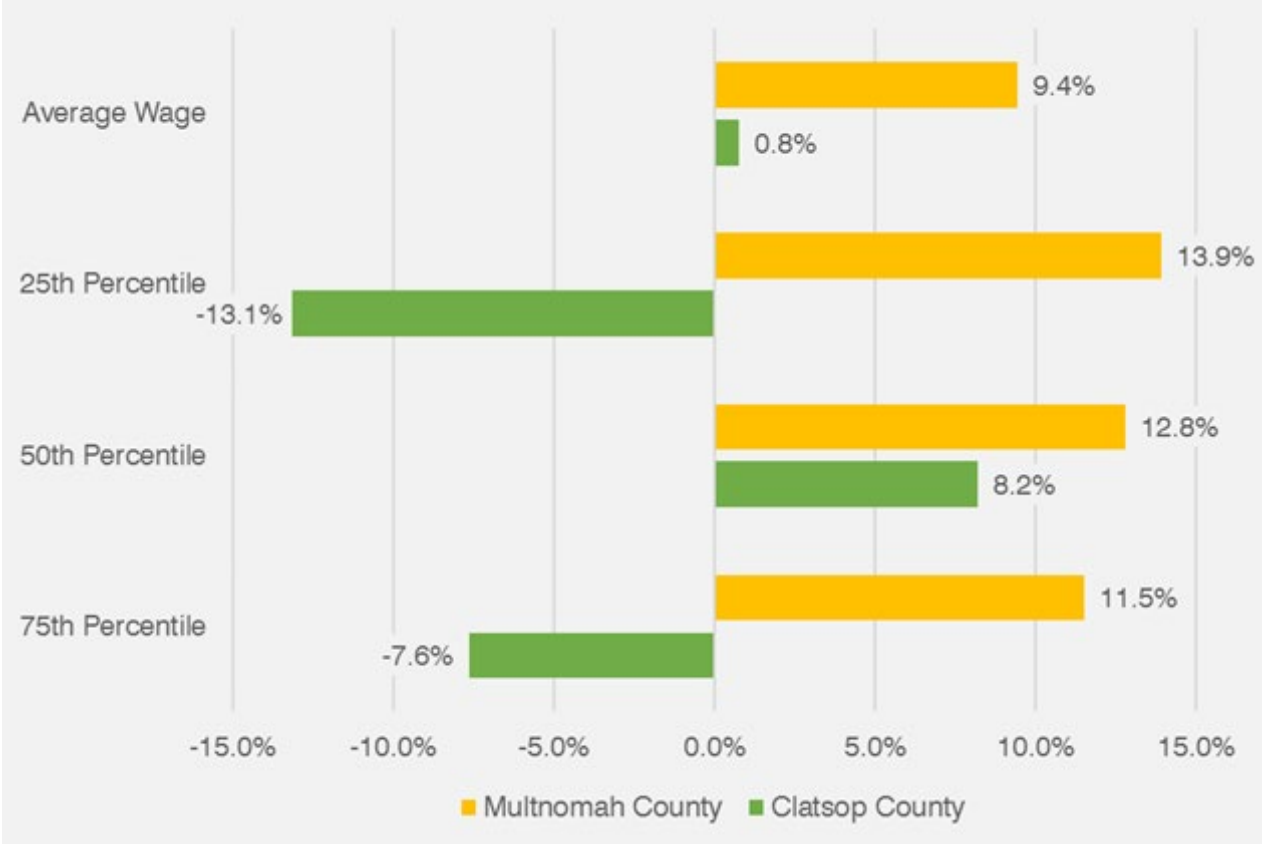


While mobility can inject new life into an economy, a trickle-down of some jobs from larger metros into secondary and tertiary markets can also impact wages and local spending power. For example, when companies that participate in an "innovation economy" in a large city establish satellite offices in smaller towns, their workers are often paid wages that exceed those paid to many local residents. This can have a ripple effect, placing upward pressure on housing prices that makes home-ownership more difficult for those original residents who don't directly benefit from increased wages.

Whether explicitly tied to mobility or not, wages in Astoria have grown within certain wage bands, while the average wage has hardly moved (**Figure 3.6**). In fact, wages at the 50th percentile in Astoria have increased rapidly, growing 8.2% between 2012 and 2015. This strengthening in middle-wage earnings is important given a December 29, 2016 article from Oregon Live, which indicates that, despite continued job growth, middle-wage jobs will continue to see fewer new job openings in the State of Oregon.

The average wage in Multnomah County, comparatively, has grown significantly across all wage levels. This highlights the importance of the mobility data presented in **Figure 3.5**, since an influx into Astoria of residents from Multnomah County could introduce a new economic dynamic in northwest Oregon.

FIGURE 3.5 CHANGE IN WAGES PAID
Multnomah and Clatsop Counties, Oregon, 2012-2015 | U.S. Census Bureau American Community Survey

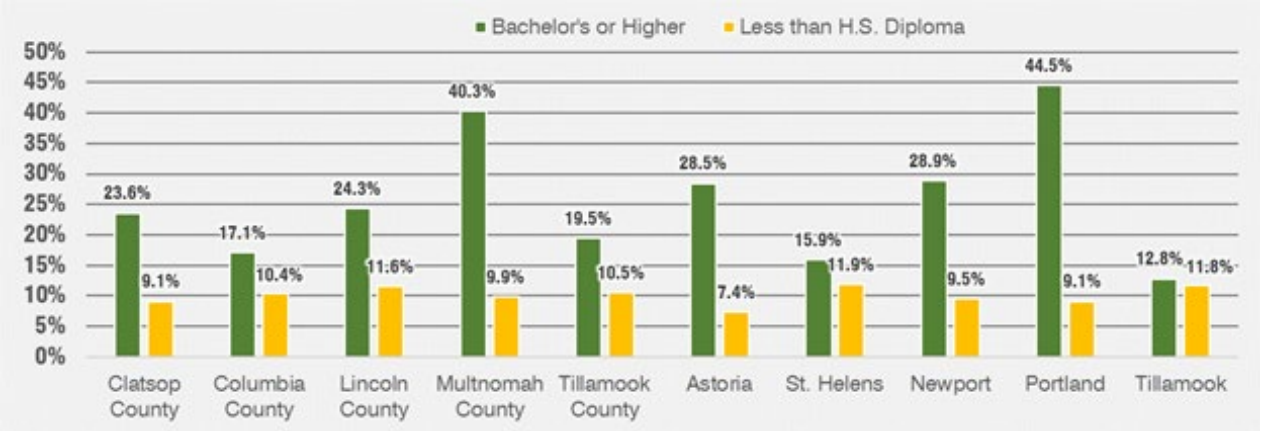


LOCAL TRENDS

Local trends are most meaningful in the context of the larger regional, national and global trends discussed earlier. The data presented here help to hone in on economic development constraints and opportunities for Astoria, given its place within a larger economic sphere.

Local educational attainment (**Figure 4.1**) is particularly important because it has ramifications for workforce capabilities, wages, business retention and attraction and other economic development concerns. About 29% of Astoria residents (25 years old or older) hold a bachelor's degree or higher, which is comparable to Newport and significantly higher than St. Helens or Tillamook. This offers a reservoir of educated workers for local companies. Notably, the portion of Astoria residents who have attained less than a high school diploma is about 7%, which is lower than any selected comparison city or county.

FIGURE 4.1 EDUCATIONAL ATTAINMENT
Selected Cities and Counties, Oregon, 2015 | U.S. Census Bureau American Community Survey

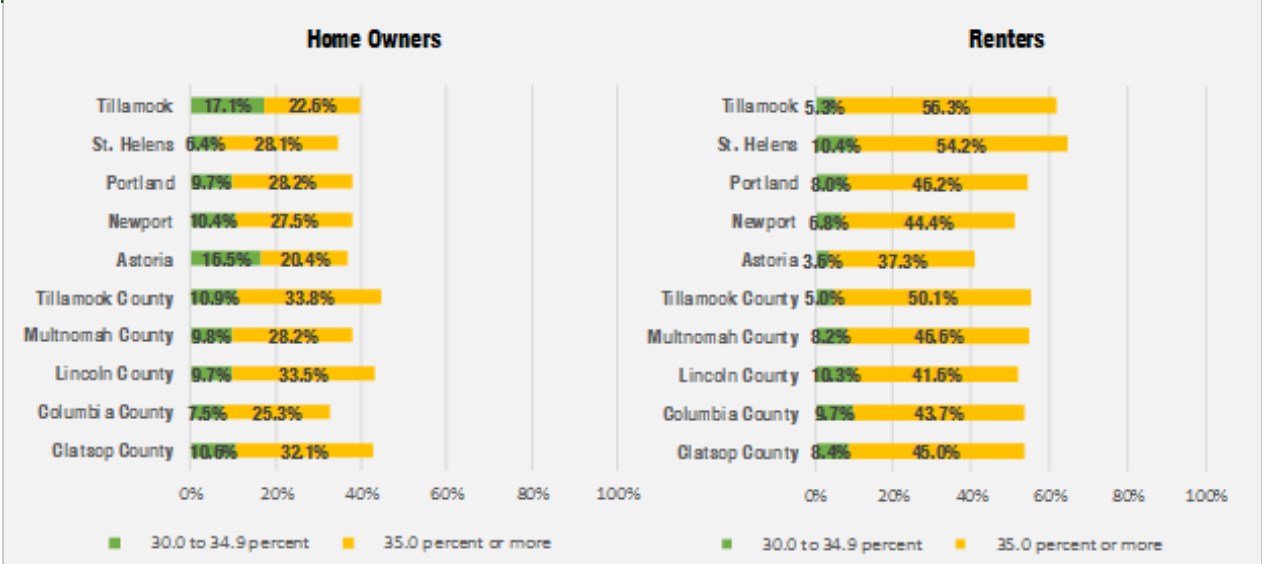


Wages tend to vary with educational attainment, so having a more educated workforce often leads to increased incomes, which in-turn promotes local spending and has a multiplicative effect on local economic activity. However, despite a relatively well-educated workforce, housing affordability represents a challenge for many Astoria residents. **Figure 4.2** shows, that housing affordability is a challenge across many Oregon communities.

In Astoria, for example, about 41% of all renters spend more than 30% of their income on housing costs, which is the level that the U.S. Department of Housing and Urban Development deems affordable. No other comparison city or county shows fewer than 50% of renters who are cost-burdened. In an absolute sense, fewer home owners are cost-burdened than renters, though Astoria's rates are more in-keeping with the selected comparison geographies.

Nevertheless, anecdotal evidence suggests that housing affordability is a key issue in Astoria. The year-over-year gains in home prices can contribute to this challenge, as can limited housing supply. Transportation costs are also an important factor to consider, since the distance between home and work can place an additional burden on a worker, even if housing costs are low.

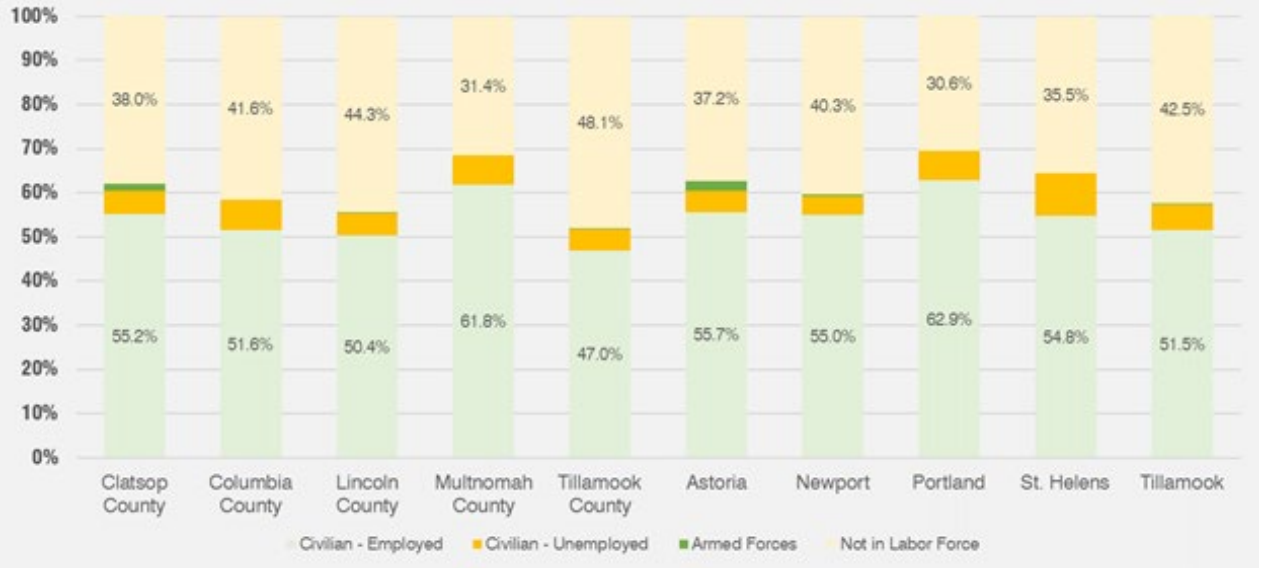
FIGURE 4.2 HOUSING AFFORDABILITY
Selected Cities and Counties, Oregon, 2015 | U.S. Census Bureau American Community Survey



Astoria also experiences a unique dynamic within the housing market due to the significant presence of the U.S. Armed Forces. Members of the Armed Forces often move more frequently, sometimes are limited by the availability of housing subsidies, and occasionally choose to live on a military base. These factors affect housing demand.

Figure 4.3 indicates that Astoria has a larger share of the population working for the military, primarily due to a significant U.S. Coast Guard presence. 2.3% of Astoria residents 16 or older are employed in the Armed Forces; according to the U.S. Census Bureau, about 500 Clatsop County residents are employed in the Armed Forces, which includes almost 200 Astoria residents.

FIGURE 4.3 EMPLOYMENT STATUS
Selected Cities and Counties, Oregon, 2015 | U.S. Census Bureau American Community Survey



For Astoria workers that are not employed in the Armed Forces, educational services, health care and social assistance represents the largest industry sector, with more than 1,000 employees. Retail trade and arts, entertainment and recreation are also significant to the local economy, with more than 650 workers each. A full breakout of employment by industry is presented in **Figure 4.4.** Location quotients, which represent the relative strength of an industry, are presented in **Figure 4.5.**

Some industry sectors aren't readily apparent in the data, but are important to economic development efforts nonetheless. **Figure 4.6** documents the locations and relative size of businesses in Astoria that compose four identified priority sectors. These sectors represent an initial discovery of economic development opportunities that the Advance Astoria initiative will pursue.

FIGURE 4.4 EMPLOYMENT BY INDUSTRY
City of Astoria, 2015 | U.S. Census Bureau American Community Survey

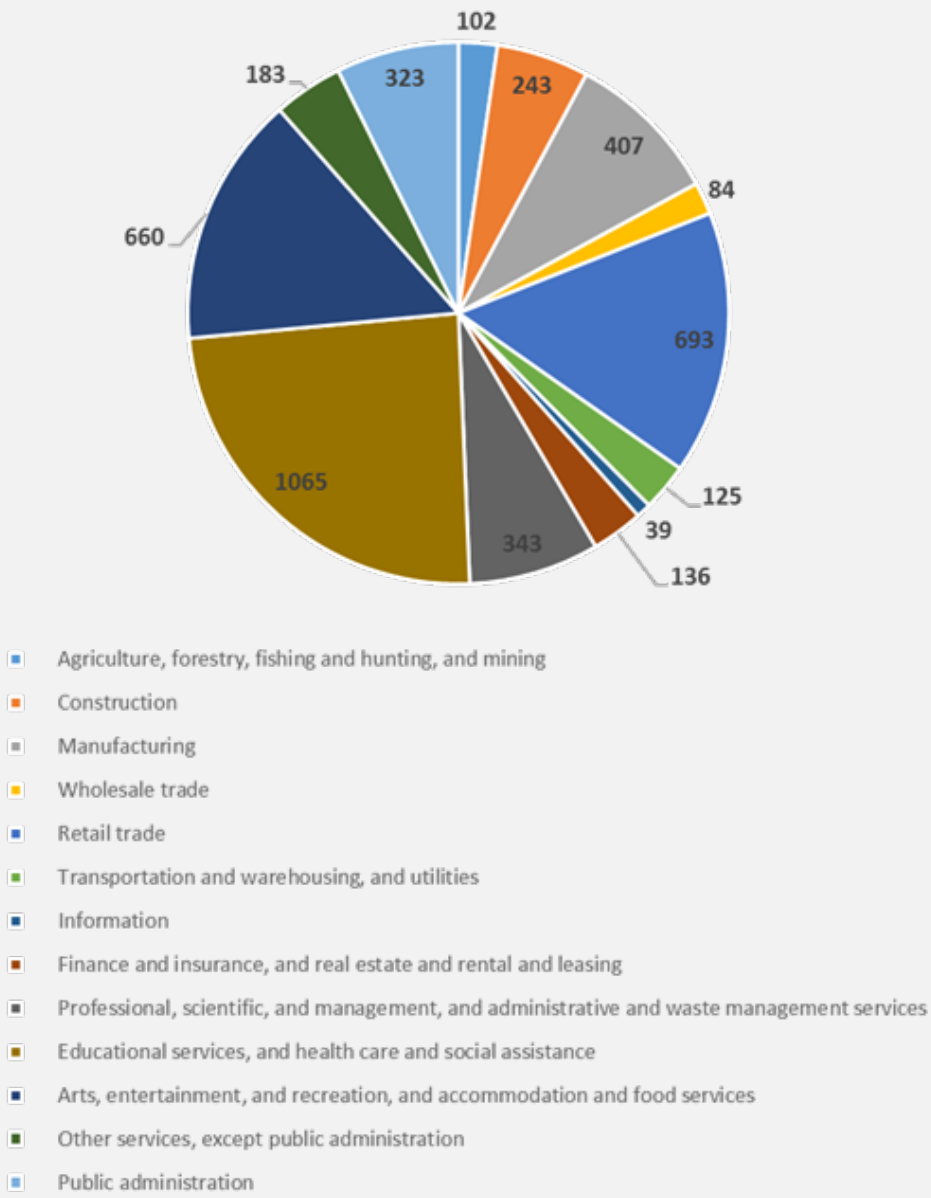


FIGURE 4.5 LOCATION QUOTIENTS BY INDUSTRY

CIty of Astoria, 2016 | Oregon DOE; Community Attributes Inc.

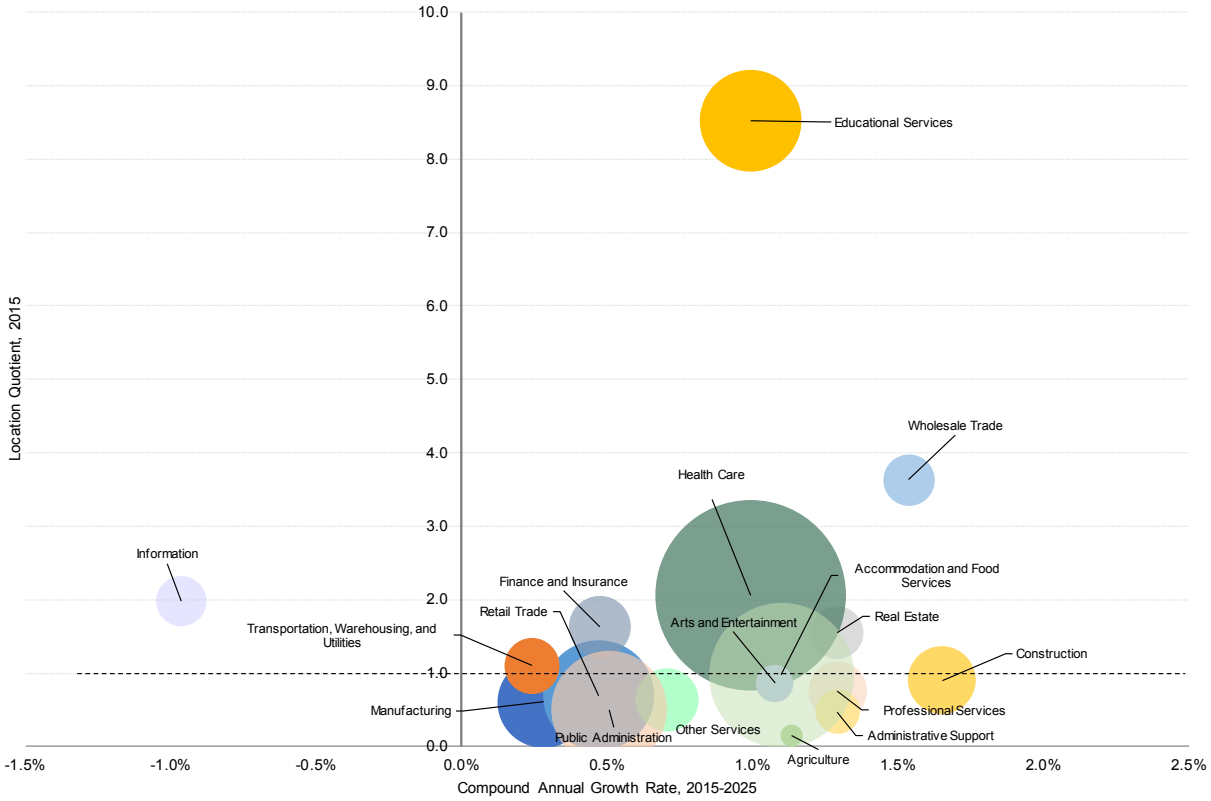
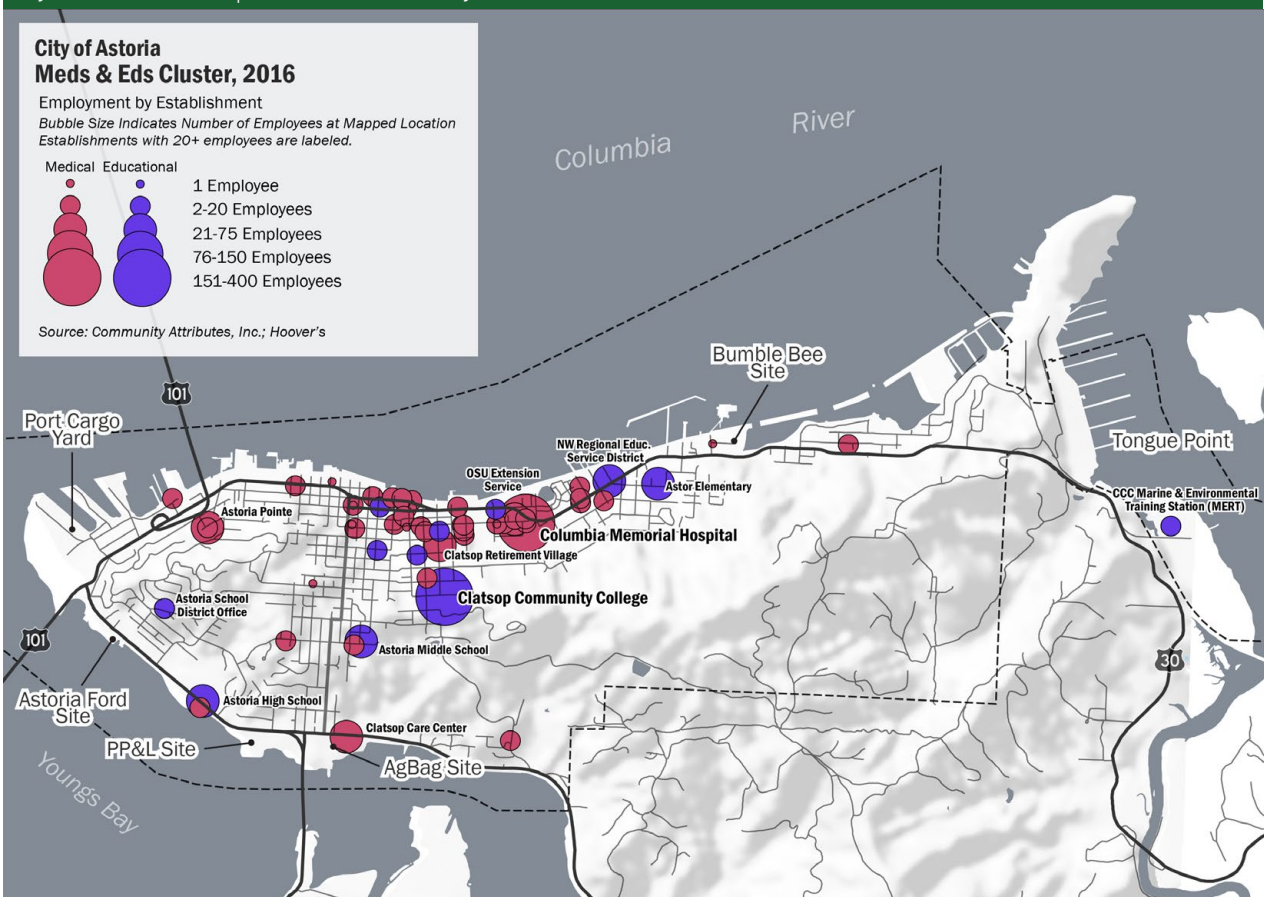
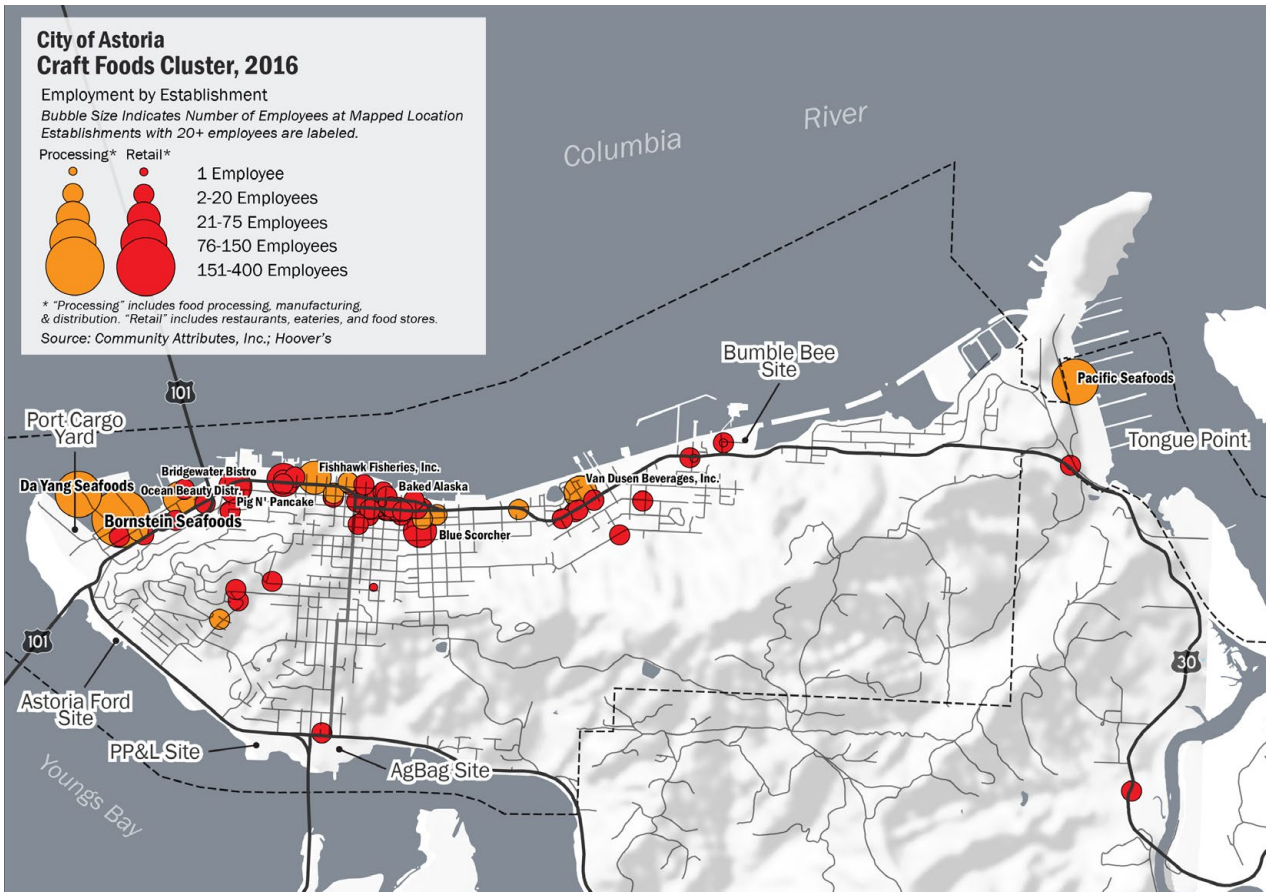
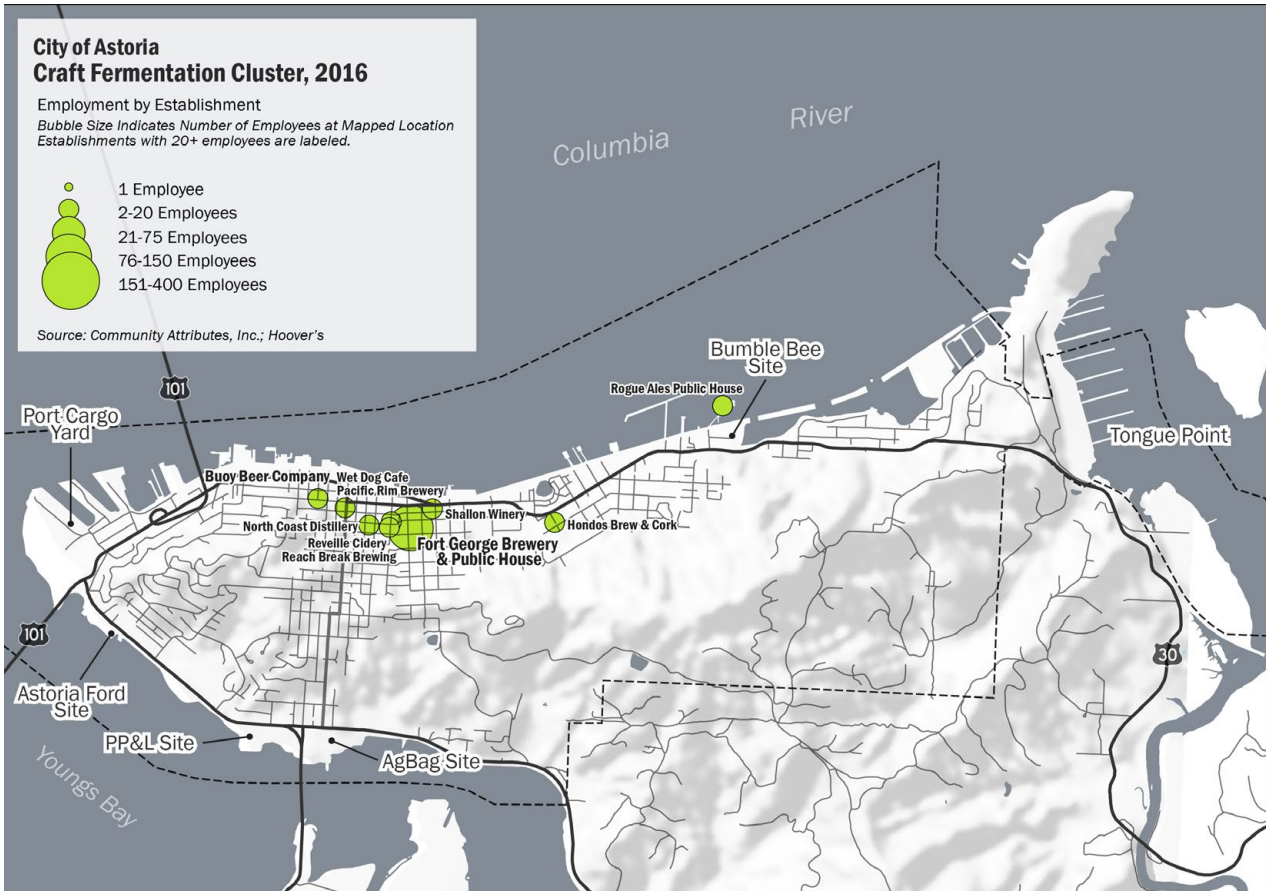


FIGURE 4.6 POTENTIAL PRIORITY ECONOMIC DEVELOPMENT CLUSTERS
CIty of Astoria, 2016 | Hoover's; Community Attributes Inc.




City of Astoria
Craft Foods Cluster, 2016
Employment by Establishment
Bubble Size Indicates Number of Employees at Mapped Location
Establishments with 20+ employees are labeled.
Processing* Retail*
1 Employee
2-20 Employees
21-75 Employees
76-150 Employees
151-400 Employees
* "Processing" includes food processing, manufacturing, & distribution. "Retail" includes restaurants, eateries, and food stores.
Source: Community Attributes, Inc.; Hoover's
Columbia River
Bumble Bee Site
Pacific Seafoods
Tongue Point
Port Cargo Yard
Bridgewater Bistro
Fishhawk Fisheries, Inc.
Da Yang Seafoods
Ocean Beauty Distr.
Pig N' Pancake
Baked Alaska
Van Dusen Beverages, Inc.
Bornstein Seafoods
Blue Scorcher
101
30
Astoria Ford Site
PP&L Site
AgBag Site
Youngs Bay


City of Astoria
Craft Fermentation Cluster, 2016
Employment by Establishment
Bubble Size Indicates Number of Employees at Mapped Location
Establishments with 20+ employees are labeled.
1 Employee
2-20 Employees
21-75 Employees
76-150 Employees
151-400 Employees
Source: Community Attributes, Inc.; Hoover's
Columbia River
Bumble Bee Site
Rogue Ales Public House
Tongue Point
Port Cargo Yard
Buoy Beer Company
Wet Dog Cafe
Pacific Rim Brewery
Shallon Winery
Hondos Brew & Cork
North Coast Distillery
Reveille Cidery
Reach Break Brewing
Fort George Brewery & Public House
101
30
Astoria Ford Site
PP&L Site
AgBag Site
Youngs Bay

[BLANK]

3 FORECASTING FUTURE GROWTH

Growth forecasts aid policymakers by presenting scenarios for the future, which can improve planning efforts. This section of the report presents a forecast for employment in Astoria through 2040, and translates the projected growth into demand for additional employment lands.

FORECASTING EMPLOYMENT

For the purposes of this EOA, CAI has developed a custom employment forecast that provides net new employment (jobs) by two-digit NAICS industry. The forecast utilizes existing forecast products from multiple entities to make projections for Astoria through 2040. The forecast methods and findings are discussed in greater detail below.

METHODS

Total employment by sector geocoded to the City of Astoria was provided via a data request from the Oregon Department of Employment (OED). This data reflects a range of employment estimates by specific industry breakouts as represented in the final forecast. OED also provides a regional forecast

Quarterly Astoria MSA total employment estimates from the U.S. Bureau of Labor Statistics provide the backend data which is used to statistically approximate the yearly employment growth rate from 2024 through 2040 via an ARIMA model.

Oregon Employment Department Regional Forecast

The baseline forecast from 2015-2024 is anchored by the OED regional forecast which covers Benton, Clatsop, Columbia, Lincoln and Tillamook Counties. The City of Astoria represents a significant share of employment in several sub industries represented in the OED forecast. Whenever possible, the employment estimate represented from 2015 through 2024 reflects the OED forecast estimates through 2024. Occasionally, these estimates are edited if the City of Astoria does not have an industry employment estimate that would be accurately captured in the OED forecast.

Community Attributes Inc. Astoria MSA Forecast

As the OED forecast only runs through 2024, it was necessary to supplement the final forecast output with a custom forecast to estimate total employment in Astoria from 2024 through 2040. This was done by looking at quarterly employment estimates from the Bureau of Labor Statistics. This forecast focuses on estimated total employment within the Astoria MSA from which year to year growth rates are calculated and then applied to the City of Astoria employment estimates. Industry specific employment estimates are a product of the OED forecast industry shares along with 2015 industry employment estimates provided by OED.

The forecast used was an ARIMA model that attempts to describe the inherent autocorrelations in the quarterly employment data and then make forecast predictions based on those quarterly trends.

FINDINGS

The forecast model indicates that total employment in Astoria will grow from 5,636 in 2016 to 7,075 in 2040. This represents a compound annual growth rate of .95%. According to the forecast, total employment in Astoria will be 6,796 at the end of the 20-year period ending in 2036.

The largest number of new jobs (460) will be located in the health care and social assistance (NAICS 62) sector, which is already Astoria's largest industry. The highest growth rates are expected to occur in construction (NAICS 23) and wholesale trade (NAICS 42) with 1.8% and 1.7% compound annual growth, respectively. Only one industry (NAICS 51 - information) is expected to shrink over the forecast period. These trends are illustrated in **Figures 2.1 and 2.2**.

UNDERSTANDING DEMAND

Generally speaking, growth in employment (new jobs) requires new buildings to house the additional employees. In this way, a growth forecast is the first step in understanding the demand for employment land.

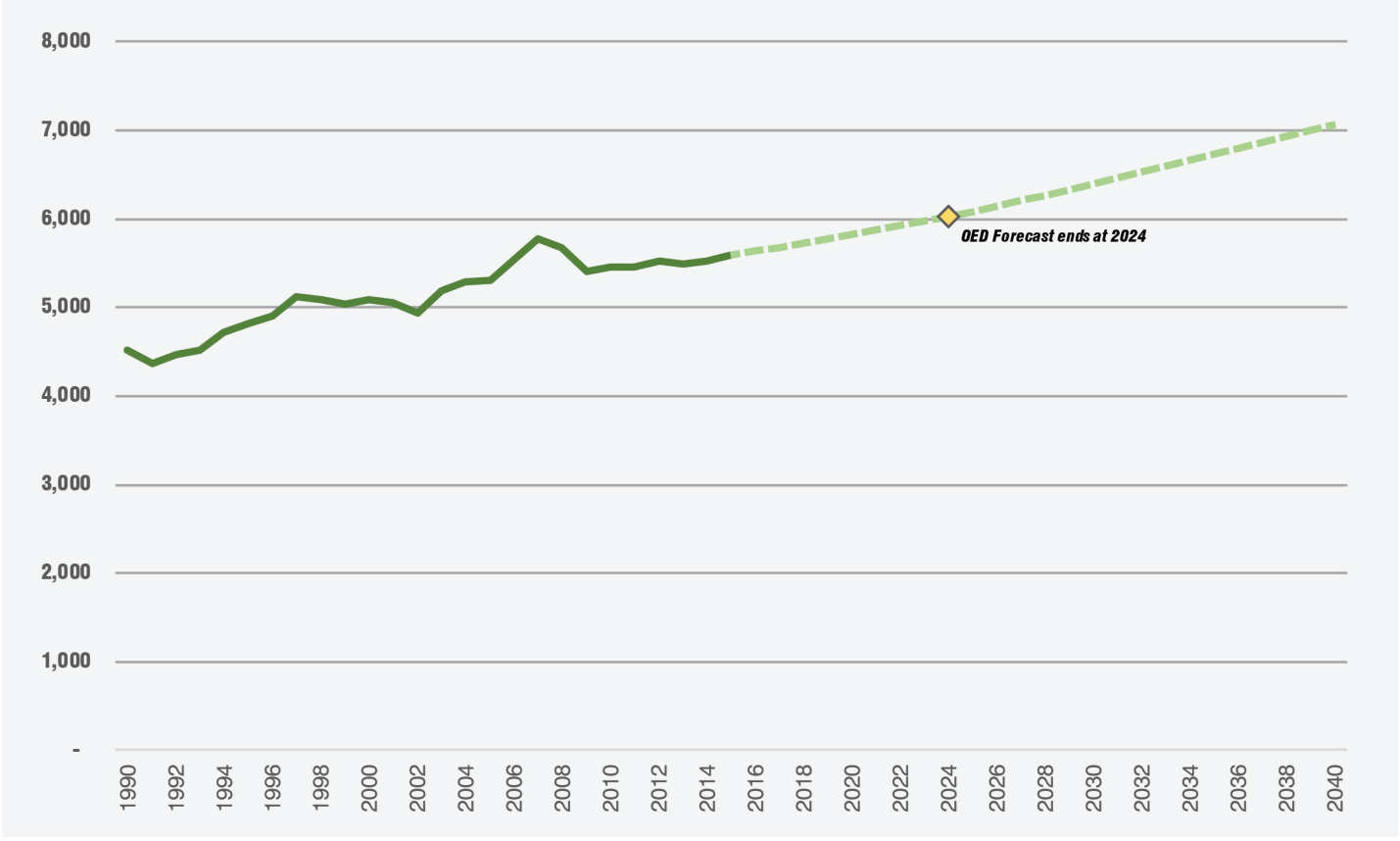
METHODS

Translating a growth forecast into demand for employment land requires an understanding of how much square footage can be built on any given parcel and an understanding of how many square feet

FIGURE 2.1 - FORECAST SUMMARY TABLE

NAICS	Industries	2016	2020	2030	2036	2040	Net New	CAGR
11	Agriculture, Forestry, Fishing & Hunting	21	22	25	28	29	8	1.3%
23	Construction	194	207	248	278	299	105	1.8%
31 - 33	Manufacturing	357	360	371	379	384	27	0.3%
42	Wholesale Trade	111	118	140	155	166	55	1.7%
44 - 45	Retail Trade	519	528	556	575	587	68	0.5%
48 - 49, 22	Transportation, Warehousing, and Utilities	130	131	134	137	138	8	0.3%
51	Information	109	104	93	88	84	(25)	-1.1%
52	Finance and Insurance	167	170	179	185	190	22	0.5%
53	Real Estate and Rental and Leasing	117	123	142	155	164	47	1.4%
54	Professional, Scientific, and Technical Services	147	155	179	195	207	60	1.4%
56	Administrative and Support, Waste Mgmt. & Remediation	84	88	102	111	118	34	1.4%
61	Educational Services	442	459	512	548	574	132	1.1%
62	Health Care and Social Assistance	1,541	1,603	1,786	1,913	2,001	460	1.1%
71	Arts, Entertainment, and Recreation	58	61	69	74	78	19	1.2%
72	Accommodation and Food Services	896	937	1,057	1,139	1,198	301	1.2%
81	Other Services (except Public Administration)	169	174	188	197	204	35	0.8%
92	Public Administration	574	584	617	640	655	81	0.6%
	Total Employment	**5,636**	**5,825**	**6,397**	**6,796**	**7,075**	**1,439**	**0.95%**
	CAGR (at interval)	**0.8%**	**0.8%**	**0.9%**	**1.0%**	**1.0%**		

FIGURE 2.2 - FORECAST SUMMARY



are required to house each employee. These variables are expressed below in a series of equations, each of which is explained to clarify the process of calculating demand for employment land.

(new employment) **X** *(square feet per employee)* **=** *(built square feet demanded)*

New employment is given in the forecast.

An assumption for the number of square feet required to house each employee is obtained using data from Hoover's, which provides facility square footage and total employment for all businesses in Astoria. Dividing the number of employees by the total facility square footage for all businesses in each NAICS-defined industry provides an empirical input from local businesses that can inform the model.

Multiplying new employment in each industry by the square footage required to house an average employee in each industry yields the number of building square feet needed to accommodate the forecasted employment growth.

(built square feet demanded) **/** *(FAR)* **=** *(land square feet demanded)*

To obtain an estimate of how much square footage can be built on any given parcel, a representative floor-to-area ratio (FAR) is applied to each group of zones. FAR is the ratio of total built square footage to total land square footage, and is expressed as a decimal. For the purposes of this analysis, the total square footage of all commercial facilities in Astoria is identified using data from Hoover's. These facilities are identified by the company's NAICS code, which can be mapped to the zones used in this study. Using buildable lands methodologies and geographic information systems (GIS), a described in Section 3 of this report, one can calculate the total square footage of occupied lands in each of those zones. Then, the total facility square footage is divided by the occupied land square footage to obtain an FAR that represents current businesses located in the selected zones.

Dividing the built square feet demanded by the FAR yields the number of land square feet needed to accommodate the forecasted employment growth.

(land square feet demanded) **X** *(zone capture rate)* **=** *(land square feet demanded by zone)*

Land square feet demanded by employment growth in each NAICS-defined industry is apportioned to the different employment-supporting zones to account for the fact that workers in some industries can find space in multiple zones (e.g. NAICS 31-33 manufacturing jobs can be located in industrial zones, but also in aquatic development zones, while NAICS 72 accommodation and food services jobs are likely to be located almost exclusively in commercial zones). Zone capture rates represent the percent of all new jobs that will locate within a given zone, and are estimates based on observed land use and employment patterns. These rates are highlighted in green in **Figure 2.3**.

Multiplying the land square feet demanded by the assigned capture rate for each zone (or group of zones) yields the number of land square feet needed to accommodate the forecasted employment growth in each zone.

(land square feet demanded by zone) **/** *43,560* **=** (*acres demanded by zone)*

There are 43,560 square feet in each acre. Dividing the land square feet demanded by zone by 43,560 converts the land demand estimate into acres needed to accommodate the forecasted employment growth in each zone. These demand estimates can then be compared to employment-supporting land supply estimates from a vacant and redevelopable or buildable lands analysis.

FIGURE 2.3 - LAND DEMAND SUMMARY

Net New Employees	SF per Employee	Total SF Demand	*Collapsed Zones:*	Aquatic Development	Attached Housing	Commercial	Industrial	Institutional	All Zones
			Assumed FAR:	0.1	0.2	0.25	0.1	0.1	
8	373	2,984		50.00%	0.00%	0.00%	50.00%	0.00%	100%
105	588	62,054		0.00%	0.00%	25.00%	75.00%	0.00%	100%
27	679	18,395		25.00%	0.00%	0.00%	75.00%	0.00%	100%
55	846	46,810		25.00%	0.00%	25.00%	50.00%	0.00%	100%
68	483	32,975		0.00%	0.00%	90.00%	10.00%	0.00%	100%
8	486	4,086		25.00%	0.00%	0.00%	75.00%	0.00%	100%
0	762	0		0.00%	0.00%	100.00%	0.00%	0.00%	100%
22	498	11,025		0.00%	0.00%	100.00%	0.00%	0.00%	100%
47	1107	52,538		0.00%	0.00%	100.00%	0.00%	0.00%	100%
60	708	42,266		10.00%	0.00%	70.00%	10.00%	10.00%	100%
34	1241	42,115		0.00%	0.00%	50.00%	0.00%	50.00%	100%
132	373	49,211		0.00%	0.00%	0.00%	0.00%	100.00%	100%
460	434	199,695		0.00%	15.00%	10.00%	0.00%	75.00%	100%
19	1048	20,091		15.00%	0.00%	15.00%	0.00%	70.00%	100%
301	370	111,587		0.00%	0.00%	100.00%	0.00%	0.00%	100%
35	875	30,292		0.00%	0.00%	50.00%	50.00%	0.00%	100%
81	332	27,019		0.00%	0.00%	0.00%	0.00%	100.00%	100%
1,439			*Demand (SF):*	26,055	29,954	320,815	110,968	265,349	753,140
			Demand (AC):	5.98	3.44	29.46	25.47	60.92	125.27

FINDINGS

This analysis suggests demand for about 125 acres of employment-supporting land. Institutional lands are subject to the highest levels of demand, with about 61 acres needed to accommodate forecasted employment growth. Significant amounts of vacant and redevelopable are necessary to accommodate anticipated growth in commercial and industrial zones, as well, with each requiring about 29 and 25 acres, respectively.

There is little demand for employment land in attached housing zones, which may be appropriate given that these are mixed-use zones with significant residential components (and therefore a limited ability to house new employment).

Inputs to this demand model are extremely sensitive. Changes in the amount of square feet needed to house a given number of workers (for example, due to increased telecommuting) could change the amount of land needed to accommodate the forecasted growth. Furthermore, some uses may be able to adapt to different zones, which would alter the assumed zone capture rates. Understanding these sensitivities is important to ensure that adopted policy creates a balanced supply of land to fit anticipated employment patterns and changes in job and development markets.

4 UNDERSTANDING THE SUPPLY OF LAND

Employment land in Astoria is provided within myriad commercial, industrial and other zones. This section of the report surveys these lands to quantify the vacant and redevelopable parcels, in acres, that may be expected to support future growth in Astoria's employment.

A buildable lands inventory (BLI) for the City of Astoria was completed in 2011. The methods employed in this EOA differ from those used in the BLI and the two analyses should be expected to produce different results. However, since there has been limited development and redevelopment in the intervening years, the employment land capacity depicted in this report may not differ greatly from the figures given in the BLI.

METHODS

Any analysis of buildable lands requires an estimate of the supply of land to meet expected growth. This EOA focuses only on employment lands, and therefore provides an estimate of the supply of land available to house employment-generating uses. To prepare this estimate, CAI assessed the City of Astoria's zoning code to identify the subset of zones that allow for commercial and industrial enterprises and other employment-generating uses. The 20 zones that were selected were then sorted into five groups based on the predominant use within each zone. Non-employment zones, such as residential or conservation and habitat zones, were excluded. This selection process is summarized in **Figure 3.1**.

The five "collapsed" zones include the aquatic development zones, attached housing zones, commercial zones, industrial zones and institutional zones. Employment lands in these zones are found throughout the City, and are most prevalent along or near waterfronts (e.g. the Columbia River, Young's Bay). More

specifically, industrial lands are clustered on Port of Astoria properties in the eastern and western portions of the City, and institutional lands are largely located in the central, upper portion of the City; commercial zones are most likely to be located in or near downtown Astoria. The map in **Figure 3.2** illustrates these employment lands.

Of all the employment lands identified in **Figure 3.2**, many parcels have already been developed, or are otherwise encumbered by critical areas, such that they cannot support additional employment. Other parcels are either vacant or redevelopable. Using parcel-based data from the Clatsop County Assessor, CAI identified vacant and redevelopable employment lands from the zones selected for the land inventory. These vacant or redevelopable portions of the total employment land inventory are represented in lighter colors in **Figure 3.3**. Notably, **Figure 3.3** also references future industrial development sites from the previous update of the Comprehensive Plan. These sites are critical components of land supply.

The identified vacant and redevelopable lands are further subdivided in tiers, to aid in understanding barriers to redevelopment, potential development timelines, and other considerations. Tier A employment lands are considered completely vacant, while Tier B employment lands are those that have lower improvement values, which suggest that existing structures may be replaced in the future. The specific criteria used to defined Tier A and Tier B lands within each collapsed zone are provided below.

- **Tier A** lands are vacant. Vacant lands are defined as parcels with very little or no improvement value, and are identified within the data by selecting parcels with $.001 Real Market Improvement Value per square foot of land.
- **Tier B** lands are potentially redevelopable. Potentially redevelopable lands are defined as parcels with limited improvements in terms of building value per square foot of land, and are identified within the data by selecting parcels with $.001 to $2.50 Real Market Improvement Value per square foot of land.

Using geographic information systems (GIS) the gross supply of Tier A and Tier B employment lands is converted to net supply by deducting land area that may not be buildable. These deductions account for roads and other rights of way, public parks, FEMA-designated floodways, wetlands, steep slopes and other similar hazards or constraints.

Rights of way and parks are contained within the GIS data, and may therefore be excluded on a parcel-by-parcel basis so that parcels unencumbered by parks and rights of way remain wholly buildable. The values used for the remaining deductions (i.e. floodways, wetlands and steep slopes) are presented below (*please note that these deductions are estimates that will be refined upon receipt of additional GIS data*).

- **Floodways** are assumed to be 7% of the parcel area for all parcels in all zones.
- **Wetlands** deductions vary by zone: for industrial zones, 25% of the parcel area for all parcels is deducted; for institutional zones, 15% of the parcel area for all parcels is deducted; for all other zones, 5% of the parcel area for all parcels is deducted.
- **Steep slope** deductions vary by zone: for institutional zones, 40% of the parcel area for all parcels is deducted; for all other zones, 5% of the parcel area for all parcels is deducted.

After deductions, net land supply is expressed in acres. It represents an estimate of the amount of land within each set of zones that can accommodate additional employment through new, greenfield

FIGURE 3.1 - ZONE SELECTIONS

Employment Land Inventory Zones (20):

ZONE	Title
A-1	Aquatic One Development zone
A-2	Aquatic Two Development Zone
A-2A	Aquatic Two-A Development Zone
AH-HC	Attached Housing/Health Care Zone
AH-MP	Attached Housing/Mill Pond
C1	Neighborhood Commercial Zone
C2	Tourist Commercial Zone
C3	General Commercial Zone
C4	Central Commercial Zone
CA	Education/Research/Health Care Campus Zone
FA	Family Activities Zone
GI	General Industrial Zone
HC	Health Care Zone
HR	Hospitality/Recreation
IN	Institutional Zone
LS	Local Service
MH	Maritime Heritage Zone
S1	Marine Industrial Shorelands
S2	General Development Shorelands Zone
S-2A	Tourist Oriented Shorelands Zone

Non-Employment Land Inventory Zones (12):

ZONE	Title
A-3	Aquatic Conservation Zone
A-4	Aquatic Natural Zone
CR	Compact Residential Zone
CRESO	Columbia River Estuary Shoreland Overlay District
FHO	Flood Hazard Overlay Zone
LR	Land Reserve Zone
PD	Planned Development Overlay Zone
R1	Low Density Residential Zone
R2	Medium Density Residential Zone
R3	High Density Residential Zone
S5	Natural Shorelands Zone
SBHO	Sensitive Bird Habitat Overlay Zone

Collapsed Employment Land Inventory Zones (20):

COLLAPSED ZONES	
Aquatic Development Zones	
	Aquatic One Development zone
	Aquatic Two Development Zone
	Aquatic Two-A Development Zone
Attached Housing Zones	
	Attached Housing/Health Care Zone
	Attached Housing/Mill Pond
Commercial Zones	
	Neighborhood Commercial Zone
	Tourist Commercial Zone
	General Commercial Zone
	Central Commercial Zone
	Local Service
	Tourist Oriented Shorelands Zone
	Maritime Heritage Zone
	Family Activities Zone
	Hospitality/Recreation
Industrial Zones	
	General Industrial Zone
	Marine Industrial Shorelands
	General Development Shorelands Zone
Institutional Zones	
	Institutional Zone
	Health Care Zone
	Education/Research/Health Care Campus Zone

FIGURE 3.2 - ASTORIA EMPLOYMENT LANDS INVENTORY

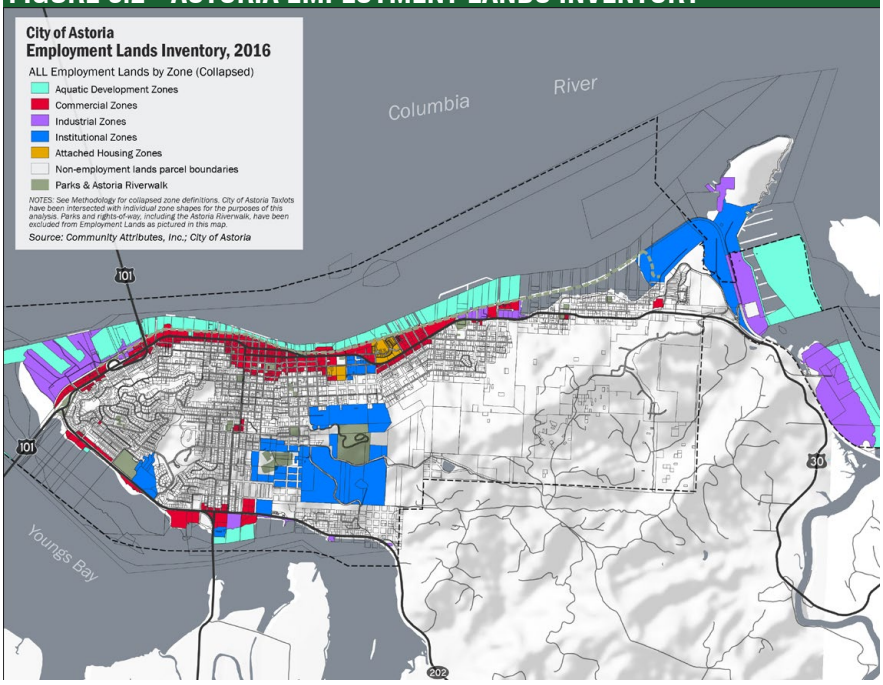
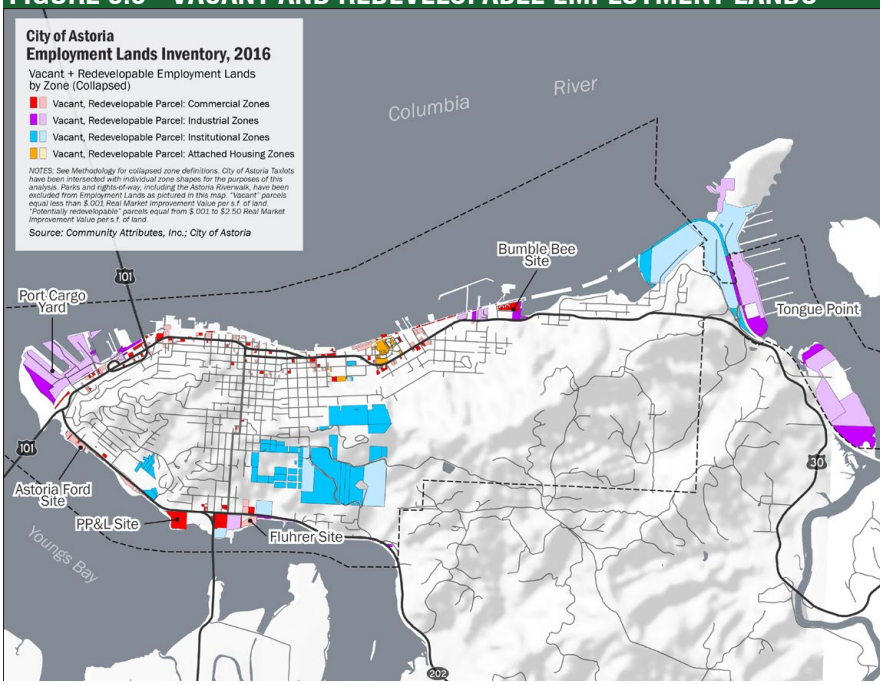


FIGURE 3.3 - VACANT AND REDEVELOPABLE EMPLOYMENT LANDS



development or redevelopment of lower-intensity or lower-value uses. A summary of net land supply for each collapsed zone, along with an overview of the deductions applied to gross land supply, is provided in **Figure 3.4**.

AQUATIC DEVELOPMENT ZONES

The method differs for aquatic development zones, which are often largely or wholly underwater and are intended to accommodate water-dependent commercial and industrial uses on-shore or occasionally on piers. For the purposes of this EOA, 2% of the total parcel area is deemed buildable. This low ratio is appropriate given the size of the parcels in these zones, as well as their intended uses, since the parcels extend well into water bodies but the employment-supporting uses are likely to locate on or near the shoreline. *Please note that this method is under review and may be updated for subsequent drafts of this report.*

FINDINGS

The following findings are based on the buildable lands analysis described above and are contained in **Figure 3.4**. Findings are presented for each of the collapsed zones presented in **Figure 3.1.** Applicable notes for **Figure 3.4** include the following:

* *See Methodology for Collapsed Zone definitions*

** *Rights-of-Way include Astoria Riverwalk rails-to-trails parcels*

*** *See Methodology for definitions of "Vacant" and "Potentially Redevelopable" lands*

**** *See Methodology for deduction assumptions (rates vary by zone & by deduction)*

- **Aquatic Development Zones** include about 892 acres of land. Of that sum, 499 acres are excluded from gross land supply due to rights of way, parks and other parcel limitations. Of the remaining 394 acres, 2% of the total area is considered buildable, for a total employment lands capacity of approximately eight acres.

- **Attached Housing Zones** include about 27 acres of land. Of that sum, approximately six acres and one-third acres are excluded from gross land supply due to rights of way and parks, respectively. Of the remaining 20 acres, about nine are considered vacant, while one acre is considered redevelopable. After deductions for floodways, wetlands and steep slopes, these zones provide a total vacant and redevelopable employment lands capacity (net supply) of about eight acres.

- **Commercial Zones** include about 297 acres of land. Of that sum, approximately 104 acres and four acres are excluded from gross land supply due to rights of way and parks, respectively. Of the remaining 188 acres, about 38 are considered vacant, while 32 acres are considered redevelopable. After deductions for floodways, wetlands and steep slopes, these zones provide a total vacant and redevelopable employment lands capacity (net supply) of about 58 acres.

- **Industrial Zones** include about 293 acres of land. Of that sum, approximately 24 acres and one-quarter acres are excluded from gross land supply due to rights of way and parks, respectively. Of the remaining 268 acres, about 58 are considered vacant, while 175 acres are

FIGURE 3.4 - VACANT AND REDEVELOPABLE LANDS SUMMARY

1 AQUATIC DEVELOPMENT ZONES

NOTE: An alternative method is used to calulate vacant and redevelopment lands in aquatic development zones, as all parcel area in this zone is under water.

Gross Land Supply	Acres	Net Land Suply	Tier 1 Vacant Lands***	Tier 2 Potentially Redevelopable Lands***	Total Vacant + Potentially Redevelopable Lands
Total Zone Area	892.45	Total Parcel Area	N/A	N/A	7.87
*Rights-of-Way / No Parcel** *	*498.87*	*Less Floodway **** *	*0.00*	*0.00*	*0.00*
Total Parcel Area, Exclusive of R.O.W.	393.58	*Less Wetland **** *	*0.00*	*0.00*	*0.00*
Parks	*0*	*Less Steep Slope **** *	*0.00*	*0.00*	*0.00*
Total Parcel Area, Exclusive of R.O.W. & Parks	393.58	Total Parcel Area, Less Deductions	N/A	N/A	7.87
		Percent of Total Parcel Area in Zone	N/A	N/A	2%

2 ATTACHED HOUSING ZONES

Gross Land Supply	Acres	Net Land Suply	Tier 1 Vacant Lands***	Tier 2 Potentially Redevelopable Lands***	Total Vacant + Potentially Redevelopable Lands
Total Zone Area	26.69	Total Parcel Area	9.24	0.92	10.16
*Rights-of-Way** *	*5.93*	*Less Floodway **** *	*0.65*	*0.06*	*0.71*
Total Parcel Area, Exclusive of R.O.W.	20.76	*Less Wetland**** *	*0.46*	*0.05*	*0.51*
Parks	*0.29*	*Less Steep Slope**** *	*0.46*	*0.05*	*0.51*
Total Parcel Area, Exclusive of R.O.W. & Parks	20.47	Total Parcel Area, Less Deductions	7.67	0.76	8.43
		Percent of Total Parcel Area in Zone	37%	4%	41%

3 COMMERCIAL ZONES*

Gross Land Supply	Acres	Net Land Suply	Tier 1 Vacant Lands***	Tier 2 Potentially Redevelopable Lands***	Total Vacant + Potentially Redevelopable Lands
Total Zone Area	296.61	Total Parcel Area	37.65	32.38	70.03
*Rights-of-Way** *	*104.4*	*Less Floodway **** *	*2.64*	*2.27*	*4.90*
Total Parcel Area, Exclusive of R.O.W.	192.21	*Less Wetland**** *	*1.88*	*1.62*	*3.50*
Parks	*4.31*	*Less Steep Slope**** *	*1.88*	*1.62*	*3.50*
Total Parcel Area, Exclusive of R.O.W. & Parks	187.9	Total Parcel Area, Less Deductions	31.25	26.88	58.12
		Percent of Total Parcel Area in Zone	17%	14%	31%

4 INDUSTRIAL ZONES *

Gross Land Supply	Acres	Net Land Suply	Tier 1 Vacant Lands***	Tier 2 Potentially Redevelopable Lands***	Total Vacant + Potentially Redevelopable Lands
Total Zone Area	292.69	Total Parcel Area	58.29	175.25	233.54
*Rights-of-Way ** *	*23.65*	*Less Floodway **** *	*4.08*	*12.27*	*16.35*
Total Parcel Area, Exclusive of R.O.W.	269.04	*Less Wetland **** *	*14.57*	*43.81*	*58.39*
Parks	*0.24*	*Less Steep Slope **** *	*2.91*	*8.76*	*11.68*
Total Parcel Area, Exclusive of R.O.W. & Parks	268.8	Total Parcel Area, Less Deductions	36.72	110.41	147.13
		Percent of Total Parcel Area in Zone	14%	41%	55%

5 INSTUTIONAL ZONES*

Gross Land Supply	Acres	Net Land Suply	Tier 1 Vacant Lands***	Tier 2 Potentially Redevelopable Lands***	Total Vacant + Potentially Redevelopable Lands
Total Zone Area	518.15	Total Parcel Area	191.09	181.52	372.61
*Rights-of-Way ** *	*37.08*	*Less Floodway **** *	*13.38*	*12.71*	*26.08*
Total Parcel Area, Exclusive of R.O.W.	481.07	*Less Wetland **** *	*28.66*	*27.23*	*55.89*
Parks	*72.75*	*Less Steep Slope**** *	*76.44*	*72.61*	*149.04*
Total Parcel Area, Exclusive of R.O.W. & Parks	408.32	Total Parcel Area, Less Deductions	72.61	68.98	141.59
		Percent of Total Parcel Area in Zone	18%	17%	35%

considered redevelopable. After deductions for floodways, wetlands and steep slopes, these zones provide a total vacant and redevelopable employment lands capacity (net supply) of about 147 acres.

- **Institutional Zones** include about 518 acres of land. Of that sum, approximately 37 acres and 73 acres are excluded from gross land supply due to rights of way and parks, respectively. Of the remaining 408 acres, about 191 are considered vacant, while 182 acres are considered redevelopable. After deductions for floodways, wetlands and steep slopes, these zones provide a total vacant and redevelopable employment lands capacity (net supply) of about 142 acres.

In total, the analysis suggests that Astoria has approximately 363 acres of vacant or redevelopable employment lands to accommodate future employment growth. This represents about 28% of the total land area in the employment-supporting zones.

5 RECONCILING SUPPLY AND DEMAND

Comparing a forecast-driven demand scenario and a assessment of buildable lands is essential to understand Astoria's ability to accommodate future growth without policy changes. This section of the report compares supply and demand estimates from previous sections to identify land surplusses or shortages.

The analysis suggests that there is sufficient vacant and redevelopable land in all zones to cover anticipated employment growth. **Figure 4.1** summarizes this analysis.

FIGURE 4.1 - SUPPLY AND DEMAND RECONCILIATION

	Aquatic Development	Attached Housing	Commercial	Industrial	Institutional	**All Zones**
Demand (Square Feet)	26,055	29,954	320,815	110,968	265,349	**753,140**
Demand (Acres)	5.98	3.44	29.46	25.47	60.92	**125.27**
Supply (Acres)	7.87	8.43	58.12	147.13	141.59	**363.15**
Surplus or (Shortage)	1.89	4.99	28.67	121.66	80.68	**237.88**

Please note that this section will be expanded after revisions to the supply and demand methodologies.