

APPENDIX



Anchorage 2040 Land Use Plan

A Supplement to Anchorage 2020 - Anchorage Bowl Comprehensive Plan



Appendix C: Anchorage Traded Sectors Analysis

For Planning and
Zoning Commission
Recommended Draft 2040
LUP, dated June 5, 2017

ANCHORAGE INDUSTRIAL TRADED SECTORS ANALYSIS

MUNICIPALITY OF ANCHORAGE
LAND USE PLAN MAP UPDATE
WITH 2016 UPDATED “HYBRID”
EMPLOYMENT FORECAST

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April 8, 2016

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I. Introduction

The Municipality of Anchorage is presently in the process of updating its Land Use Plan Map and related land use policies to prepare the community for economic growth and change over the next 25 years.

Leading up to this effort, the Municipality recently had completed a 2015 Industrial Lands Assessment Update.¹ The report found that over a twenty-year period, the Municipality does not have enough land zoned for industrial uses to accommodate a likely economic growth trajectory for Anchorage.

Among various recommendations made by the Assessment Update was to identify Anchorage's Industrial Traded Sectors and to better understand their production function, including their need for land, along with utilities and transportation infrastructure. By Traded Sector, the report referred to key industries in Anchorage that sell goods and services to businesses, households, and governments outside of Anchorage. In other words, those businesses that are particularly important for bringing more dollars into the economy due to commerce with customers in Anchorage but also outside of Anchorage.

By understanding the business and land needs of these key Traded Sectors firms, a better idea emerges about of how much industrial land, where, and what kinds of infrastructure and utilities are essential to their economic viability and ability to expand.

As a follow-up to the recommendation made by the 2015 Anchorage Industrial Lands Assessment update, this report is a detailed study of Anchorage's Traded Sectors so defined, with emphasis on Traded Sectors in Anchorage that require industrial land and sites as opposed to other major land uses (Office, etc.).

The report is divided into the following sections:

- I. Introduction**
- II. Key Findings**
- III. Traded Industry Sectors Introduction**
- IV. Anchorage Traded Sectors**
- V. Planning for Industrial Traded Sectors**
- VI. Policy Implications & Recommendations**

¹<http://www.muni.org/Departments/OCPD/Planning/Projects/AnchLandUse/Pages/AnchorageIndustrialLandAssessment.aspx>

II. Key Findings

Anchorage has roughly five types of Industrial Traded Sectors – Industrial land-utilizing industry sectors that are vital to the local economy by disproportionately exporting goods and services to elsewhere across the State, elsewhere in the U.S., or internationally. By doing so, they disproportionately support the community with dollars circulated through the Anchorage economy and employment at higher wages than average, or typically “family-wage” jobs.

They are:

- **Various Manufacturing Businesses – including the nascent Marijuana Industry;**
- **Power Generation;**
- **Non-Metal Mineral Mining;**
- **Air & Water Transportation;**
- **Professional & Technical (Business) Services.**

The following are key summary statistics for five key Industrial Traded Sectors in Anchorage:

- Employment: 25,548 jobs (12.6% of Anchorage total employment in five key sectors)
- Average annual wages: \$67,035 (\$57,553 Anchorage average)
- Export Trade Revenues: \$3.3 billion in export revenues (the five key sectors alone represent 19% of Anchorage total)
- Total Business Revenues: \$6.3 billion in gross business revenues (the five key sectors alone account for 16% of the Anchorage total)

Not only have these key sectors added jobs at a faster rate than the broader economy, they are expected to continue to exceed broader economic growth over the next twenty years.

- Broad Industrial Traded Sectors in Anchorage are expected to add as much as 4,800 jobs by 2035 and roughly 6,250 jobs between 2015 and 2040, under the Baseline “Hybrid” growth scenario².
- Broad Traded Sector job growth represents 14% of total job growth in Anchorage under the Baseline “Hybrid” growth scenario.
- The Anchorage economy added 5,758 jobs between 2009 and 2014, for an average annual growth rate of 0.8%.
- Anchorage’s broad Industrial Traded Sectors added 1,483 jobs between 2009 and 2014 for 1.45% annual growth and accounting for 26% of new jobs in Anchorage.

² Baseline “Hybrid” Growth Scenario and other possible scenarios for rate of future growth are provided in the April 19, 2016 “Anchorage Employment & Non-Residential Land Need Forecasts” report, to be available on the Land Use Plan Map project website.

Given continued expected growth in these Traded Sectors and higher wages that they pay, it is recommended that the Municipality ensure adequate industrial land to at the very least guarantee their continued presence and expansion in Anchorage.

- Broad Industrial Traded Sectors are expected to drive the need for at least 384 acres of industrial land, excluding Airport and Utility lands, through 2040 under the Baseline "Hybrid" Scenario.
- Demand for industrial land by Broad Traded Sectors is expected to account for 57% of total industrial land need within the Municipality through 2040, as opposed to just 29% of total job growth.

With land supply becoming increasingly constrained within the Anchorage Bowl, the Municipality will have to balance different land use designations to balance need by different uses. As it does so, it is recommended that the Municipality recognize that Industrial Traded Sectors are found to not only support higher-than-average wage jobs, but on a per-acre basis also contribute more taxable assessed real and personal property value investment than Retail uses. The following table provides taxable assessed value findings for a sample of six representative industrial and commercial sites of varying size and uses.

User/Land Use	Site Zoning	Site Size (Acres)	Structure (Sq. Ft.)	FAR*	Assessed Value (000s)				
					Land	Building	Equipment	Total	Per Acre
Industrial									
Manufacturing Traded Sector	I-1	0.5	7,771	0.36	\$138.7	\$896.4	\$738.6	\$1,773.7	\$3,614.1
Manufacturing Traded Sector	I-1	13.6	66,180	0.11	\$4,657.8	\$7,154.0	\$9,882.6	\$21,694.4	\$1,598.5
Business Park-Using Traded Sector	I-1	<u>0.5</u>	<u>12,169</u>	<u>0.54</u>	<u>\$272.8</u>	<u>\$1,245.4</u>	<u>\$163.7</u>	<u>\$1,681.9</u>	<u>\$3,285.6</u>
Industrial Averages:		4.9	28,707	0.34	\$1,689.8	\$3,098.6	\$3,595.0	\$8,383.4	\$2,832.7
Office									
Office-Using Traded Sector	B-3	3.1	97,820	0.73	\$2,629.4	\$12,471.5	\$4,239.1	\$19,340.0	\$6,323.1
Retail									
Retail Medium Format	I-1	1.6	14,545	0.20	\$1,293.9	\$1,794.6	\$1,524.1	\$4,612.6	\$2,819.9
Retail Large Format	I-1	<u>16.3</u>	<u>154,642</u>	<u>0.22</u>	<u>\$9,211.0</u>	<u>\$13,606.5</u>	<u>\$11,393.9</u>	<u>\$34,211.4</u>	<u>\$2,092.5</u>
Retail Averages:		9.0	84,594	0.21	\$5,252.5	\$7,700.6	\$6,459.0	\$19,412.0	\$2,456.2
Traded Sectors Averages:		4.4	45,985	0.44	\$1,924.7	\$5,441.8	\$3,756.0	\$11,122.5	\$3,705.3

SOURCE: Municipality of Anchorage and PNW Economics, LLC

*Floor Area Ratio

Office-using Traded Sectors, and higher-density Office use generally, tends to contribute the most per acre due to its increasingly common high-rise development type in Anchorage. The Petroleum Industry Cluster and Traded Sector is still recognized as the most economically valuable in Anchorage according to most measures, which primarily utilizes Office space.

Given the known inventory of industrially-zoned land within the Municipality, as well as known inventory of lands zoned Public Lands Institutional and Transition Lands, the implications for prioritizing Industrial Traded Sector growth in Anchorage include:

- Choosing to avoid rezoning appropriate, candidate Public Land Institutional and/or Transition Lands (identified in the 2015 Anchorage Industrial Lands Assessment Update

report)³ will guarantee the need to enhancement industrial land inventory in Anchorage via stronger protections such as industrial sanctuary designations, greater restriction on commercial uses for I-zones, and potential rezones from commercial to industrial within the Anchorage Bowl.

- Choosing to rezone candidate PLI and T lands in Anchorage will significantly help meet the need of Traded Sector growth within the Anchorage Bowl under the “High Range” Bowl land inventory found in the 2015 Anchorage Industrial Lands Assessment Update.
- Rezoning candidate PLI and T lands under the “Low Range” Bowl Inventory found in the 2015 Anchorage Industrial Lands Assessment Update is not sufficient for Traded Sector growth, leaving a 74-acre deficit that will require some industrial zone enhancements within the Anchorage Bowl.
- Under any circumstance, Chugiak-Eagle River will need to be ready to receive some Traded Sector and/or Non-Traded Sector growth through 2040 and will thus require infrastructure and utility planning and provision.

III. Traded Industry Sectors Introduction

Traded Sector Defined

Traded Sectors vs. Local Sectors

The Anchorage economy comprises numerous sectors and industries that do business with each other, government, and of course, with households. The business-customer relationship intrinsic to any economy is commonly referred to as “trade” in economic literature. Goods and services are traded for payment between all businesses, government, and households in vast quantity on a daily basis.

Since roughly 1985⁴ and then again in 1991,⁵ the study of both urban geography and international trade in economics has more formally distinguished between different customer-seller trade relationships in the study of economic growth and trade. The result is that different industries in an economy can be divided into one of two categories:

- **Traded (Tradable) Sectors:** Locally produced goods and services that are sold or “traded” with non-local businesses and households. The three types of non-local customers for this type of trade are:
 - Trade with other regions (Intrastate);

³ The candidate PLI and T zoned parcels refer only to specific parcels identified in the 2015 Anchorage Industrial Lands Assessment Update as being potentially appropriate for reclassifying to industrial use. These candidates do not include all PLI and T zoned properties.

⁴ Helpman, Elhanan, and Paul R. Krugman. 1985. *Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition, and the International Economy*. Cambridge, MA: MIT Press.

⁵ Krugman, Paul R. 1991. *Geography and Trade*. Cambridge, MA: MIT Press.

- Trade with other states (Domestic Trade); and
- International trade.
- **Non-Traded (Local) Sectors:** Locally produced goods and services that are sold or “traded” with local businesses and households.

If an economy was entirely local, that is local businesses with only local customers, long term stability would be impossible because of *economic leakage*. In other words, local customers only purchase *a portion* of their goods and services from local businesses. The rest, and sometimes the majority, are purchases from businesses outside of a local area. Travel, and more recently, Internet commerce has emerged as a classic example of economic leakage.

It is therefore crucial that a local economy maintain and grow its Traded Sectors, who by definition are the opposite of economic leakage by enjoying trade with households, businesses, and governments outside of a local area.

In economic development practice, Traded Sectors have the following primary virtues:

- *Traded Sectors counterbalance the natural leakage of income from a local economy due to household and business spending on goods and services from outside of a region.*
- *Traded Sectors are usually concentrated in Natural Resource and Manufacturing sectors that capitalize on local competitive advantages related to resource abundance, location, and ease of transportation.*
- *Traded Sectors generally pay higher average wages than Local Sectors due to the greater magnitude of non-local customers and sales revenue per employee.*

Traded Sectors & Land Use

Industrial Land

From a land use perspective, Traded Sectors are *usually* associated with Industrial Land-utilizing businesses:

- Core Natural Resource and Manufacturing sectors;
- Support sectors such as Warehousing, Transportation, Energy, and Wholesale Trade.

This is primarily due to the common characteristic of Traded Sectors to be uniquely associated with a local economy due to the locality’s mix of natural resources, energy sources, or transportation advantages and the combination of the three.

Alaskan Traded Sectors with such presence in Anchorage – as will be discussed in greater detail later in this report – include wood products manufacturing, air transportation, and food manufacturing.

Office Land

However, Traded Sectors can certainly include Office Commercial-utilizing businesses such as headquarters, administration, and support related to typical Traded Sector activities. The primary example of an Alaskan Traded Sector with significant Anchorage presence would be petroleum

extraction and petroleum industry service providers that occupy much office space within the Municipality.

Retail Land

In some cases of high-volume visitor spending, Traded Sectors can include Retail/Service Commercial Land-utilizing businesses. Anchorage's strong tourism sector, as well as its role as statewide commercial retail center, attests to retail land in Anchorage serving some Traded Sector purpose. The issue is not treated in this report in detail due to a focus on identifying Traded Sectors that have the highest rates of business trade under different criteria, which significantly outperform all retail uses.

IMPLAN Methodology

To identify and quantify the economics of Anchorage's Traded Sectors, PNW Economics utilized the IMPLAN (IMpacts for PLANing)⁶ economic impact analysis model. Originally developed by the Forest Service to assist in land and resource management planning, IMPLAN is an economic impact model designed for analyzing the effects of industry activity (employment, income, or business revenues) upon all other industries in an economic area.

The IMPLAN model utilizes detailed economic data for a geographic region and then estimates the detailed economic interactions between all private and public sectors of the specified economy based on publicly available data for a local economy as well as how industry sectors are known to interact with one another at the national level.

Comprehensive estimates of economic activity, including labor utilization, income, business revenues, trade with geography external to the study area, tax expenditures, and many other variables are possible with the IMPLAN model.

As such, results expressed in this analysis are estimates of economic activity as modeled by IMPLAN for the Municipality of Anchorage economy. Because results are modeled estimates, they should not be construed as precise or even confidential business data.

IV. Anchorage Traded Sectors

Traded Sectors Definition Considerations

Traded Sectors & Land Constraint

Anchorage faces similar challenges to other central city jurisdictions within a metro area: a geographically constrained supply of land. Anchorage is further challenged by natural barriers to urbanization, specifically the Chugach Mountains and the Cook Inlet. Anchorage is further hemmed in by JBER, making the Anchorage Bowl unique among central cities across the United States: a central urban area that does not border a suburb.

⁶ <http://www.implan.com/>

At some level, therefore, Anchorage should plan for future growth and economic development by recognizing its core Traded Sectors and prioritizing its new land use policies – including redevelopment, infill, and retention of appropriately zoned lands – to best facilitate its broader business retention, expansion, and attraction (BREA) efforts.

Accommodation of different types of Traded Sector growth, as well as any other sectors of the economy, with increasing constraint on land capacity will require some understanding of the relative value or contribution of key sectors for the local economy.

Traded Sector Alternate Definitions

Very generally, a Traded Sector is one that significantly or primarily does business with customers from outside of an economic region, here the Municipality of Anchorage. But “significantly” or “primarily” can be vague, particularly with regard to the topic of land use policies and economic development prioritization.

Four ways to further refine the definition of key Traded Sectors for prioritizing economic development and land use priorities would primarily include:

- Gross magnitude of business revenues in trade (to areas outside of Anchorage);
- Percentage of business revenues attributed to trade. (75%+);
- Total sector annual employment; and
- Sector annual compensation (wages).

Gross Export Revenues

Sheer magnitude of annual revenues earned by an Anchorage business from trade with customers outside of Anchorage is a first and major potential criterion for consideration as a key Traded Sector. Figure 1 provides a summary of the twenty Anchorage industry sectors, out of 54 candidates, whose revenues are due to trade with customers outside of Anchorage, whether trade is domestic, international, or both.

Results of the analysis in Figure 1 demonstrate the importance of the petroleum industry cluster in Anchorage, with Petroleum Extraction and Pipeline Transportation firms combining for \$9 billion in revenue from trade outside of Anchorage, or over half of Anchorage export trade (\$16.9 billion) in 2012.

Overall, Anchorage’s top exporting sectors generated an estimated \$30.3 billion in gross revenues. That equates to an impressive 76% of all business revenues combined for all Anchorage businesses and sectors. In other words, the Anchorage economy is clearly dependent upon businesses that trade goods and services with customers outside of Anchorage.

Figure 1 - Top 20 Exporting Anchorage Industry Sectors (2012 data)

Gross Revenues Rank	Exports as % of Revenues Rank	Sector	Business Revenues	Revenues from	Exports as %	Employment	Compensation per Job
			(millions)	Export (millions)	of Revenues		
1	8	Petroleum Extraction	\$5,533.0	\$5,084.0	92%	1,749.0	\$228,620
2	1	Pipeline Transportation	\$4,021.1	\$3,995.4	99%	935.6	\$144,180
8	12	Air Transportation	\$1,436.1	\$1,240.0	86%	3,179.0	\$82,950
4	32	Professional, Scientific, Technical Services	\$2,858.2	\$1,023.1	36%	17,043.6	\$68,220
5	33	Health & Social Services	\$2,849.4	\$845.3	30%	26,356.5	\$57,450
14	21	Scenic & Sightseeing Transportation	\$797.1	\$505.7	63%	5,811.3	\$91,010
10	29	Telecommunications	\$1,111.2	\$450.1	41%	2,862.6	\$94,970
16	22	Truck Transportation	\$643.5	\$383.2	60%	2,198.1	\$65,720
3	47	Real Estate & Property Services	\$3,396.4	\$368.7	11%	7,836.1	\$18,300
12	30	Administrative Services	\$877.2	\$331.5	38%	9,380.2	\$34,420
7	39	Retail Trade	\$1,459.3	\$231.0	16%	19,291.2	\$34,290
18	28	Non-Metallic Mineral Mining	\$523.0	\$230.4	44%	1,738.9	\$158,120
25	5	Lodging	\$227.7	\$213.1	94%	2,839.0	\$29,490
24	20	Food Manufacturing	\$245.3	\$190.8	78%	872.7	\$50,070
26	15	Water Transportation	\$219.5	\$183.0	83%	236.0	\$87,040
17	35	Maintenance Construction Activity	\$615.2	\$147.1	24%	2,572.4	\$92,260
9	48	Financial Services	\$1,385.0	\$142.1	10%	7,004.7	\$62,340
23	24	Waste Management Services	\$275.0	\$137.5	50%	1,097.7	\$85,430
11	44	Wholesale Trade	\$1,048.5	\$119.9	11%	4,173.4	\$74,420
15	41	Other Services	\$779.4	\$106.2	14%	10,385.3	\$35,900

SOURCE: IMPLAN and PNW Economics, LLC

Other findings for this first Traded Sector criterion include:

- *Employment:* The top 20 exporting Anchorage sectors account for over 62% of all jobs.
- *Employee Compensation:* Average employee compensation, including all pay, benefits, payroll taxes and other employee-related expenses, was \$79,760 in 2012, or 28% higher than the Anchorage average for all sectors (\$62,441).
- *Predominance of Office/Institutional Uses:* From a land use perspective, four of the top five sectors (Petroleum Extraction; Pipeline Transportation; Professional, Scientific, Technical Services; Health & Social Services) predominantly require office or comparable institutional space rather than either industrial or retail commercial types of space. This would underscore the fundamental importance of office space and land needs as part of balancing future land need in the Anchorage Bowl. However, as discussed below, office space demands are much easier to meet in a constrained land market than industrial sector needs, due to office potential for multi-story development.

Intensity of Export Trade

While the magnitude of export trade by Anchorage businesses is important, for Traded Sector designation as part of land use policy discussion, the *intensity* or share of business revenues attributable to trade should also be factored. Anchorage sectors with significant export business in Figure 1 actually conduct far more commerce locally than they trade. Prime examples include Real Estate & Property Services (11% of revenue in export trade) and Retail Trade (16% of revenue in export trade).

Accordingly, Figure 2 summarizes economic characteristics for the top twenty Anchorage sectors based on the share of sector revenue attributable to domestic and international trade. The petroleum industry cluster is still of fundamental importance (ranked 1st and 8th according to the intensity of trade scale).

However, with this stricter criterion, Anchorage's Traded Sectors are more frequently manufacturers led by Apparel, Machinery, Computer & Electronic Productions, Textiles, and Furniture & Related Products. In fact, 12 of the top twenty Anchorage sectors displayed in Figure 2 are Manufacturing sectors.

Figure 2 - Top 20 Anchorage Industry Sectors by Share of Business Revenues in Trade (2012 data)

Gross Revenues Rank	Exports as % of Revenues Rank	Sector	Business Revenues		Exports as % of Revenues	Employment	Compensation per Job
			(millions)	Revenues from Export (millions)			
2	1	Pipeline Transportation	\$4,021.1	\$3,995.4	99%	935.6	\$228,620
50	2	Apparel Manufacturing	\$2.5	\$2.4	99%	27.8	n/a
44	3	Machinery Manufacturing	\$25.0	\$24.4	98%	58.5	\$49,230
49	4	Computer & Electronic Products Manufacturin	\$3.9	\$3.8	97%	8.9	\$99,600
25	5	Lodging	\$227.7	\$213.1	94%	2,839.0	\$57,450
52	6	Textile Manufacturing	\$0.4	\$0.4	93%	3.3	\$36,310
45	7	Furniture & Related Products Manufacturing	\$24.4	\$22.5	92%	126.5	\$32,060
1	8	Petroleum Extraction	\$5,533.0	\$5,084.0	92%	1,749.0	\$65,720
40	9	Electrical Equipment & Appliances Manufactur	\$59.6	\$53.7	90%	156.2	\$74,790
51	10	Forest Products	\$0.7	\$0.7	90%	5.6	n/a
43	11	Primary Metals Manufacturing	\$26.3	\$23.2	88%	52.2	\$48,940
8	12	Air Transportation	\$1,436.1	\$1,240.0	86%	3,179.0	\$158,120
46	13	Transportation Equipment Manufacturing	\$23.9	\$20.4	85%	69.2	\$50,210
30	14	Fabricated Metal Products Manufacturing	\$116.3	\$97.9	84%	526.1	\$51,250
26	15	Water Transportation	\$219.5	\$183.0	83%	236.0	\$87,040
38	16	Commercial Fishing, Hunting, Trapping	\$65.3	\$53.8	82%	1,089.0	n/a
37	17	Plastics & Rubber Products Manufacturing	\$68.4	\$56.3	82%	132.5	\$60,130
42	18	Other Manufacturing	\$44.8	\$36.6	82%	504.9	\$15,730
36	19	Metal Ore Mining	\$79.5	\$64.4	81%	126.0	\$53,350
24	20	Food Manufacturing	\$245.3	\$190.8	78%	872.7	\$35,900

SOURCE: IMPLAN and PNW Economics, LLC

Other findings for this refined Traded Sector criterion include:

- *Gross Business Revenues:* The top twenty trade-intensive sectors in Anchorage earned \$12.2 billion in sales in 2012, or 30% of all Anchorage business revenues that year.
- *Employment & Compensation:* The top 20 export-intensive Anchorage sectors account for over 6% of all jobs. Average compensation was \$70,850 in 2012, or 13.5% above the Anchorage average for all sectors.
- *Predominance of Industrial Uses:* From a land use perspective, 14 of the top 20 sectors predominantly require industrial space and land, led by Manufacturing and Transportation sectors.

Intensity of Export Trade Revenue per Job

In a second refinement, to reflect a constrained land environment in Anchorage, top export-intensive firms detailed in Figure 2 were then filtered by magnitude of exports per employee. Export revenue per employee is then a screen for which sectors not only support the Anchorage economy with substantial trade export, but also are most productive given their employment

and then likely land use needs for that employment. With increasingly constrained land supply in Anchorage, uses that provide the most trade business intensity, as well as pay higher wages, are particularly important to understand.

Figure 3 - Anchorage Trade-Intensive Industry Sectors by Export Trade per Sector Job (2012 data)

Sector	Business			Employment	Compensation per Job	Revenues per Job (thousands)	Exports per Job (thousands)
	Revenues (millions)	Revenues from Export (millions)	Exports as % of Revenues				
Petroleum Extraction	\$5,533.0	\$5,084.0	92%	1,749.0	\$228,620	\$7,371.5	\$6,756.3
Pipeline Transportation	\$4,021.1	\$3,995.4	99%	935.6	\$144,180	\$4,298.1	\$4,270.6
Food Manufacturing	\$245.3	\$190.8	78%	872.7	\$50,070	\$5,825.2	\$3,491.5
Plastics & Rubber Products Manufacturing	\$68.4	\$56.3	82%	132.5	\$60,130	\$4,349.4	\$3,246.0
Transportation Equipment Manufacturing	\$23.9	\$20.4	85%	69.2	\$50,210	\$3,597.2	\$3,128.5
Electrical Equipment & Appliances Manufacturing	\$59.6	\$53.7	90%	156.2	\$74,790	\$2,607.8	\$2,438.7
Real Estate & Property Services	\$3,396.4	\$368.7	11%	7,836.1	\$18,300	\$4,155.4	\$2,403.6
Fabricated Metal Products Manufacturing	\$116.3	\$97.9	84%	526.1	\$51,250	\$2,613.0	\$2,223.3
Primary Metals Manufacturing	\$26.3	\$23.2	88%	52.2	\$48,940	\$2,306.0	\$2,101.6
Petroleum Products Manufacturing	\$89.6	\$14.1	16%	26.3	\$126,960	\$11,498.9	\$2,016.6
Machinery Manufacturing	\$25.0	\$24.4	98%	58.5	\$49,230	\$1,923.9	\$1,855.9
Beverage Manufacturing	\$63.9	\$29.1	46%	94.2	\$36,640	\$2,685.6	\$1,530.3
Power Generation & Distribution	\$366.4	\$46.6	13%	348.4	\$141,260	\$5,669.7	\$1,157.8
Metal Ore Mining	\$79.5	\$64.4	81%	126.0	\$53,350	\$1,264.6	\$1,024.3
Computer & Electronic Products Manufacturing	\$3.9	\$3.8	97%	8.9	\$99,600	\$897.6	\$869.0
Furniture & Related Products Manufacturing	\$24.4	\$22.5	92%	126.5	\$32,060	\$912.8	\$817.6
Water Transportation	\$219.5	\$183.0	83%	236.0	\$87,040	\$929.8	\$775.4
Non-Metallic Mineral Mining	\$523.0	\$230.4	44%	1,738.9	\$158,120	\$2,255.6	\$631.1
Other Manufacturing	\$44.8	\$36.6	82%	504.9	\$15,730	\$759.2	\$626.5
Professional, Scientific, Technical Services	\$2,858.2	\$1,023.1	36%	17,043.6	\$68,220	\$2,215.1	\$503.4

SOURCE: IMPLAN and PNW Economics, LLC

The petroleum industry cluster’s standing as foundational to the Anchorage economy continues to be recognized by this more specific Traded Sector definition. However, 15 of the top 20 Traded Sectors under this more stringent definition are Manufacturing or Transportation-related, which overwhelmingly utilize industrial space and land.

Based on the combined criteria of being export-intensive and highly productive per sector employee, we would recommend a more formal definition of Anchorage Industrial Traded Sectors to be based upon findings expressed in Figure 3. The following section will address the additional screen of Traded Sector firms’ land usage patterns as a filter for land use policy discussion purposes.

Anchorage Industrial Traded Sectors

Current Economic Characteristics

The last screen necessary to identify Anchorage’s Industrial Traded Sectors – or those that primarily utilize industrial land instead of office or retail typologies – is to filter Traded Sectors in Figure 3 by likely business space and site utilization.

To do this, we draw up on a review of what each industry sector’s presence comprises in Anchorage as well as the findings of both the *2012 Commercial Lands Assessment* and the *2015 Industrial Lands Assessment Update*.

- Largely excludes Anchorage Petroleum Extraction and Transportation employment (primarily office-utilizing for North Slope/regional headquarters);

- Excludes Real Estate & Property Services (primarily utilize office and retail commercial services space);
- Excludes Metal Ore Mining Sectors (similarly headquarters office type presence in Anchorage); and
- Excludes roughly 75% of Professional/Business Services (most of the sector utilizes office space, most notably Native Corporation and subsidiary headquarters. Though industrial business park does let the sector have both low cost office and storage or other business function need).

The resulting inventory of Anchorage Industrial Traded Sectors is found in Figure 4.

Figure 4 - Anchorage Industrial Traded Sectors by Export Revenue per Job (2012 data)

Sector	Business	Revenues from Export (millions)	Exports as % of Revenues	Employment	Compensation per Job	Revenues per Job (thousands)	Exports per Job (thousands)
	Revenues (millions)						
Food Manufacturing	\$245.3	\$190.8	78%	872.7	\$50,070	\$5,825.2	\$3,491.5
Plastics & Rubber Products Manufacturing	\$68.4	\$56.3	82%	132.5	\$60,130	\$4,349.4	\$3,246.0
Transportation Equipment Manufacturing	\$23.9	\$20.4	85%	69.2	\$50,210	\$3,597.2	\$3,128.5
Electrical Equipment & Appliances Manufacturing	\$59.6	\$53.7	90%	156.2	\$74,790	\$2,607.8	\$2,438.7
Fabricated Metal Products Manufacturing	\$116.3	\$97.9	84%	526.1	\$51,250	\$2,613.0	\$2,223.3
Primary Metals Manufacturing	\$26.3	\$23.2	88%	52.2	\$48,940	\$2,306.0	\$2,101.6
Petroleum Products Manufacturing	\$89.6	\$14.1	16%	26.3	\$126,960	\$11,498.9	\$2,016.6
Machinery Manufacturing	\$25.0	\$24.4	98%	58.5	\$49,230	\$1,923.9	\$1,855.9
Beverage Manufacturing	\$63.9	\$29.1	46%	94.2	\$36,640	\$2,685.6	\$1,530.3
Power Generation & Distribution	\$366.4	\$46.6	13%	348.4	\$141,260	\$5,669.7	\$1,157.8
Computer & Electronic Products Manufacturing	\$3.9	\$3.8	97%	8.9	\$99,600	\$897.6	\$869.0
Furniture & Related Products Manufacturing	\$24.4	\$22.5	92%	126.5	\$32,060	\$912.8	\$817.6
Water Transportation	\$219.5	\$183.0	83%	236.0	\$87,040	\$929.8	\$775.4
Non-Metallic Mineral Mining	\$523.0	\$230.4	44%	1,738.9	\$158,120	\$2,255.6	\$631.1
Other Manufacturing	\$44.8	\$36.6	82%	504.9	\$15,730	\$759.2	\$626.5
Professional, Scientific, Technical Services	\$2,858.2	\$1,023.1	36%	17,043.6	\$68,220	\$2,215.1	\$503.4
Nonmetallic Mineral Manufacturing	\$80.7	\$40.8	51%	289.6	\$42,320	\$967.1	\$450.8
Air Transportation	\$1,436.1	\$1,240.0	86%	3,179.0	\$82,950	\$451.8	\$390.1
Wood Products Manufacturing	\$12.0	\$2.2	18%	81.4	\$28,870	\$985.6	\$344.0
Textile Manufacturing	\$0.4	\$0.4	93%	3.3	\$36,310	\$263.8	\$247.3

SOURCE: IMPLAN and PNW Economics, LLC

The following are key summary statistics for resulting Industrial Traded Sectors in Anchorage:

- Employment: 25,548 jobs (12.6% of Anchorage total employment)
- Average annual wages: \$67,035 (\$57,553 Anchorage average)
- Export Trade Revenues: \$3.3 billion in export revenues (19% of Anchorage total)
- Total Business Revenues: \$6.3 billion in gross business revenues (16% of Anchorage total)

Given the identification of Industrial Traded Sectors for Anchorage and their contribution to the local economy, the following section provides an analysis of growth prospects for the 2015-2040 Land Use Map planning horizon.

Future Growth Projections

Industrial Traded Sector Job Growth

With the identification of Anchorage’s Industrial Traded Sectors within the context of constrained land supply issues, it is possible to ascertain future land need issues for the identified sectors. First, in Figure 5, the April 2016 Draft Land Use Plan Map “Hybrid” Baseline employment forecast is displayed with the four broad⁷ Traded Sectors called out.

Figure 5 – MOA Traded Sectors Baseline Employment Growth Forecast, 2015-2040

Baseline No KAC Bridge Scenario Employment Sector	Total Employment						Δ	
	2015	2020	2025	2030	2035	2040	'15-'35	'15-'40
Mining	4,370	4,160	4,290	4,420	4,550	4,680	180	310
Construction	11,460	11,640	11,970	12,300	12,630	12,960	1,170	1,500
Manufacturing	2,400	2,400	2,500	2,600	2,700	2,800	300	400
Wholesale Trade	5,060	5,550	5,900	6,250	6,600	6,950	1,540	1,890
Retail Trade	21,310	22,000	23,080	24,160	25,240	26,320	3,930	5,010
Transportation, Warehousing & Utilities	12,880	13,340	14,070	14,800	15,530	16,260	2,650	3,380
Information	3,800	3,800	3,930	4,060	4,190	4,320	390	520
Financial Activities	8,700	8,700	9,050	9,400	9,750	10,100	1,050	1,400
Professional & Business Services*	6,000	6,330	6,790	7,240	7,700	8,160	1,700	2,160
Education & Health Services	26,180	28,000	30,650	33,300	35,950	38,600	9,770	12,420
Leisure & Hospitality	18,590	19,700	21,130	22,560	23,990	25,420	5,400	6,830
Other Services	6,450	6,620	6,900	7,180	7,460	7,740	1,010	1,290
Government	30,900	30,700	30,900	31,100	31,300	31,500	400	600
Total	176,090	181,920	191,510	201,100	210,690	220,280	34,600	44,190
Industrial Traded Sectors Total	25,650	26,230	27,650	29,060	30,480	31,900	4,830	6,250

*Only industrial land-utilizing share of sector employment growth displayed for Traded Sector summary statistical purposes.

SOURCE: IMPLAN and PNW Economics, LLC

Key findings:

- Broad Traded Sectors in Anchorage are expected to add over 4,800 jobs by 2035 and roughly 6,250 jobs between 2015 and 2040.
- Broad Traded Sector job growth represents 14% of total job growth in Anchorage under the Baseline “Hybrid” growth scenario.
- Transportation, Warehousing & Utilities leads among the four Broad Industrial Traded Sectors with nearly 3,400 new jobs anticipated by 2040, followed by the industrial-space utilizing portion of Professional & Business Services (2,160 new jobs by 2040).

⁷ Anchorage industrial Traded Sectors identified to this point are extremely specific in detail. For land use forecasting purposes for the Land Use Plan Map process, broader industry sector categories are the basis of analysis. Therefore, the term “broad” refers to the larger industry sector that is not limited to Traded Sectors, but greatly comprises the estimates.

For context, according to Alaska Department of Labor & Workforce Development Quarterly Census of Employment & Wages (QCEW) data⁸:

- The Anchorage economy added 5,758 jobs between 2009 and 2014, for an average annual growth rate of 0.8%.
- Anchorage's Broad Industrial Traded Sectors added 1,483 jobs between 2009 and 2014 for 1.45% annual growth and accounting for 26% of new jobs in Anchorage.

Moving forward, the updated Baseline "Hybrid" growth forecast indicates that Anchorage Industrial Traded Sectors and the overall economy should both average roughly 0.9% annually. However, the higher average wages of the Traded Sectors (\$71,093 annually according to 2014 AKDOLWD data) will proportionately contribute to greater Anchorage household income growth than the overall economy (\$55,320 average wage in 2014).

Industrial Traded Sector Industrial Land Need

Figure 6, therefore, provides industrial land need through 2040 under the "Hybrid" Baseline forecast for the Anchorage Land Use Plan Map Update process. Broad Traded Sector industrial land need is called out in comparison to land need by other sectors. For context, the "Hybrid" Baseline scenario expresses the most growth among the moderate-growth forecasts considered by the Municipality for land use planning purposes.

Key findings under "Hybrid" Baseline forecast:

- Broad Traded Sectors are expected to drive the need for 384 acres of industrial land between 2015 and 2040.
- Demand for industrial land by Broad Traded Sectors accounts for 57% of total industrial land need within the Municipality through 2040, as opposed to just 29% of total job growth.
- While Professional & Business Services led among Broad Traded Sector job growth, Transportation, Warehousing & Utilities is expected to lead demand for industrial land at 325 acres through 2040.
- Professional & Business Services will require roughly 110 acres through 2040 according to the Baseline forecast. Mining is expected to see net industrial land need reduction over the period, while Manufacturing will drive need for 65.7 acres including expected industrial Marijuana use need.

⁸ <http://laborstats.alaska.gov/qcew/annual.xls>

Figure 6 – MOA Traded Sectors Baseline Industrial Land Need Forecast, 2015-2040

Baseline Scenario Employment Sector	Industrial Space Need (000s of sq. ft.)				Predicted Land Need (Acres)			
	2035	2040	'15-'35	'15-'40	2035	2040	'15-'35	'15-'40
Mining	1,640.4	1,687.3	64.9	111.8	256.2	257.1	-9.0	-8.1
Construction	3,272.1	3,357.6	303.1	388.6	450.9	451.4	9.9	10.4
Manufacturing	4,570.8	4,740.1	507.8	677.1	334.6	338.6	14.0	18.0
Wholesale Trade	4,436.8	4,672.1	1,035.2	1,270.5	247.5	254.3	43.0	49.7
Retail Trade	3,783.5	3,945.4	589.1	751.0	295.5	300.6	26.6	31.7
Transportation, Warehousing & Utilities	18,495.6	19,365.0	3,156.0	4,025.4	2,549.0	2,603.7	270.4	325.1
Information	645.7	665.8	60.1	80.2	36.9	37.1	0.8	1.0
Financial Activities	1,001.7	1,037.7	107.9	143.9	102.0	103.1	3.9	5.0
Professional & Business Services	5,537.7	5,866.7	1,224.4	1,553.4	564.1	583.0	90.5	109.5
Education & Health Services	3,592.7	3,857.5	976.4	1,241.2	323.7	339.1	69.6	85.0
Leisure & Hospitality	2,198.1	2,329.1	494.8	625.8	234.1	242.0	38.6	46.5
Other Services	3,681.6	3,819.8	498.4	636.6	269.5	272.8	18.3	21.6
Government	2,261.4	2,275.8	28.9	43.3	220.8	216.7	-14.1	-18.2
Total	55,118.1	57,619.9	9,047.0	11,548.8	5,884.9	5,999.7	562.5	677.3
Total Broad Traded Sector Demand			4,953.1	6,367.7			365.9	444.4
Less: Airport & Utility Sector Demand			1,447.5	1,847.8			90.0	108.4
Total Non-Airport/Utility Demand			3,505.6	4,519.9			275.9	336.0
Plus: Marijuana Sector Industrial Demand*			457.3	457.3			47.7	47.7
Total - Traded Sectors Demand			3,962.9	4,977.2			323.6	383.7

*From Figure 3-18, page 46 of the 2015 Anchorage Industrial Land Assessment Update: Volume I

Industrial Traded Sector Firm Characteristics

Firm Size & Site Size Need

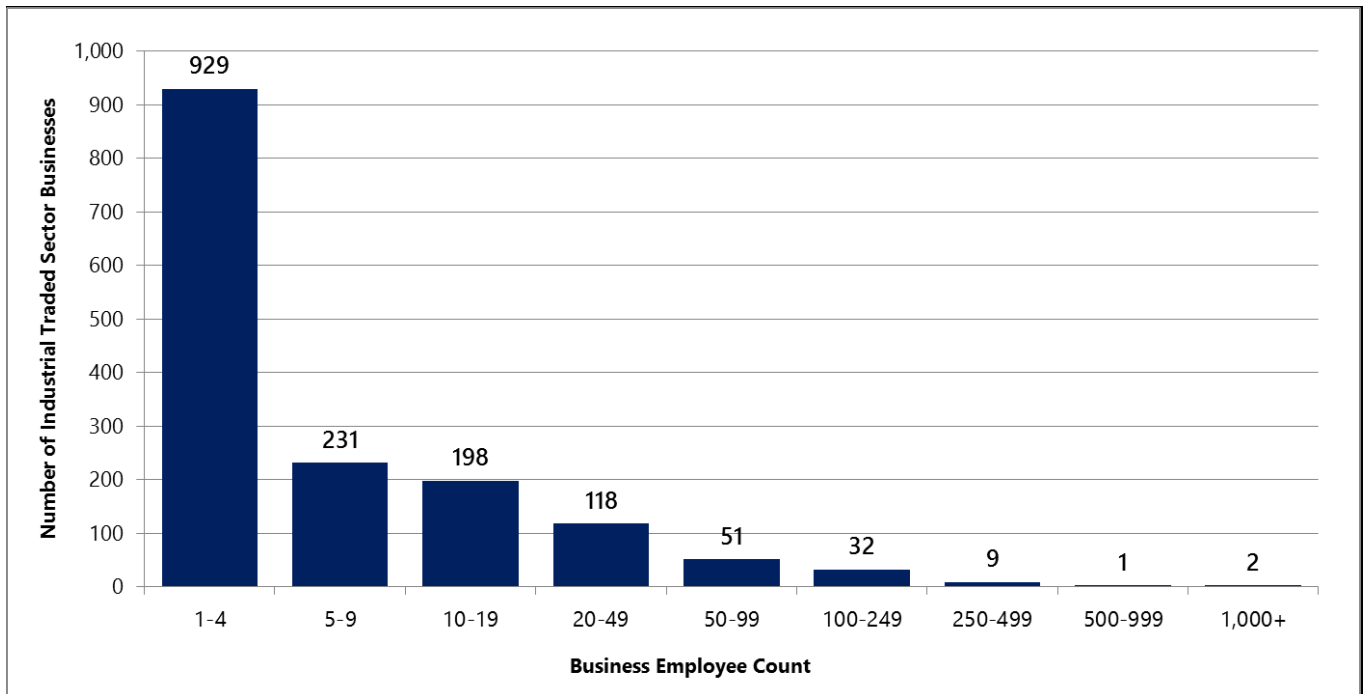
A review of U.S. Census County Business Pattern data⁹ reveals the typical size of Anchorage Industrial Traded Sector firms in terms of employment, which in turn can be used to understand the typical industrial site size need for such firms.

First, Figure 7 provides a count of Anchorage Industrial Traded Sector businesses by typical employment size ranges. Overall, Industrial Traded Sector employers are mostly moderately sized.

- Only 12 firms, or less than 1%, have greater than 250 employees and are limited to Air Transportation (2) and Professional & Technical Business Services (9).
- In contrast, 1,160, or 74% of all Industrial Traded Sector firms have fewer than ten employees, led by Professional & Technical Business Services (889), Transportation (170), and Manufacturing (94).

⁹ <http://www.census.gov/econ/cbp/>

Figure 7 – MOA Industrial Traded Sector Firm Sizes by Employment (2012)

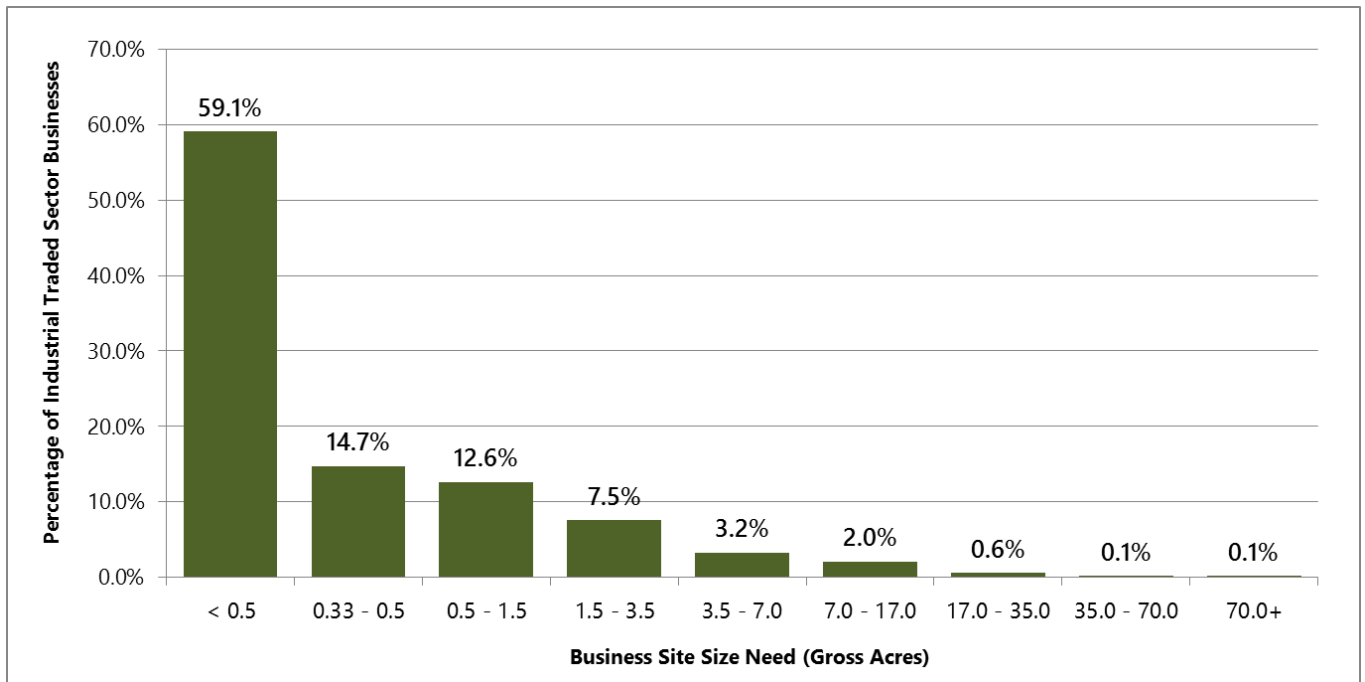


SOURCE: U.S. Census County Business Patterns and PNW Economics, LLC

Given that past and current known characteristics are the best predictor of future firm behavior, estimates of typical Industrial Traded Sector Firm site size needs can be characterized. Utilizing average space usage assumptions and average floor area ratio statistics for Anchorage industrial firms as documented in the 2015 Anchorage Industrial Lands Assessment Update, typical site needs by gross acreage can be estimated. Figure 8 provides the results of the analysis.

- Roughly 59% of all firms require space on a site of less than ½-acre in size. In other words, for nearly 60% of Industrial Traded Industry Sectors, a business park and/or multi-tenant structure situation is required.
- Over 27% of all Industrial Traded Sector firms require space on sites of between 1/3-acres and 1.5 acres. These firms may require business park and/or multi-tenant structures, or will potentially be large enough for stand-alone facilities.
- 12.7% of all firms require facilities on likely stand-alone sites anywhere from 1.5 acres to 17 acres in size.
- The remaining 0.8% utilizes very large industrial sites. Though few in count, they are substantial employers that with broader economic growth would look to expand operations in Anchorage.

Figure 8 – MOA Industrial Traded Sector Firm Site Size Ranges (Gross Acres)



SOURCE: U.S. Census County Business Patterns and PNW Economics, LLC

Transportation Infrastructure & Utilities Need: All Industrial Traded Sectors

Industry sector data from the IMPLAN model for Anchorage also includes detailed production function data by sectors. That is, results of the model also provide detailed estimates of various business operations expenses, including detailed utilities costs by type and transportation costs by mode of travel.

It can therefore be determined what each Industrial Traded Sector in Anchorage considers to be essential utilities and transportation infrastructure based on relative magnitude of usage and related expense. The results of such an analysis for identified Industrial Traded Sectors are found in the following figures:

- *Figure 9 – MOA Industrial Trade Sectors Utilities Usage by Type; and*
- *Figure 10 – MOA Industrial Traded Sectors Transportation Expense by Mode.*

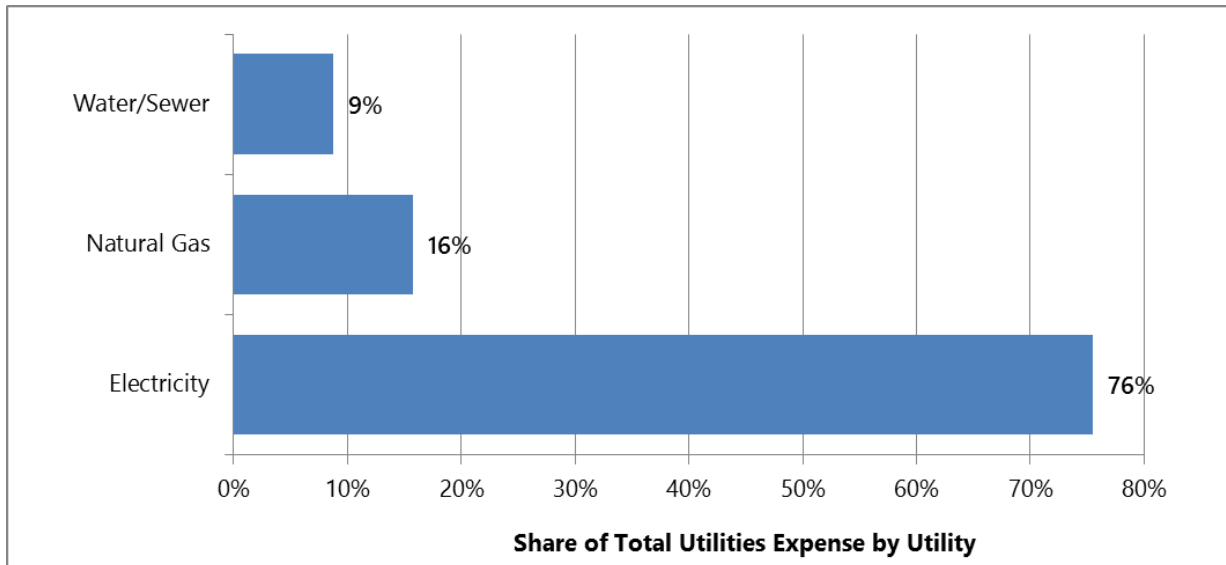
Each is discussed in turn.

Utilities Usage

As Figure 9 indicates, Anchorage’s Industrial Traded Sectors utilize all three of the major categories of public and private utilities: Water/Sewer, Natural Gas, and Electricity. But far and away, electrical power is the biggest expense and need in terms of utilities provision. On average, 76% of all Industrial Traded Sectors’ utilities expense is Electricity, with Natural Gas and Water/Sewer a distant second and third. In other words, for future industrial land planning for

Traded Sectors, access to all three utilities is important, but access to sufficient electrical power capacity is crucial from a production function perspective. Still, water and sewer are very necessary.

Figure 9 – MOA Industrial Traded Sectors Utilities Usage by Type

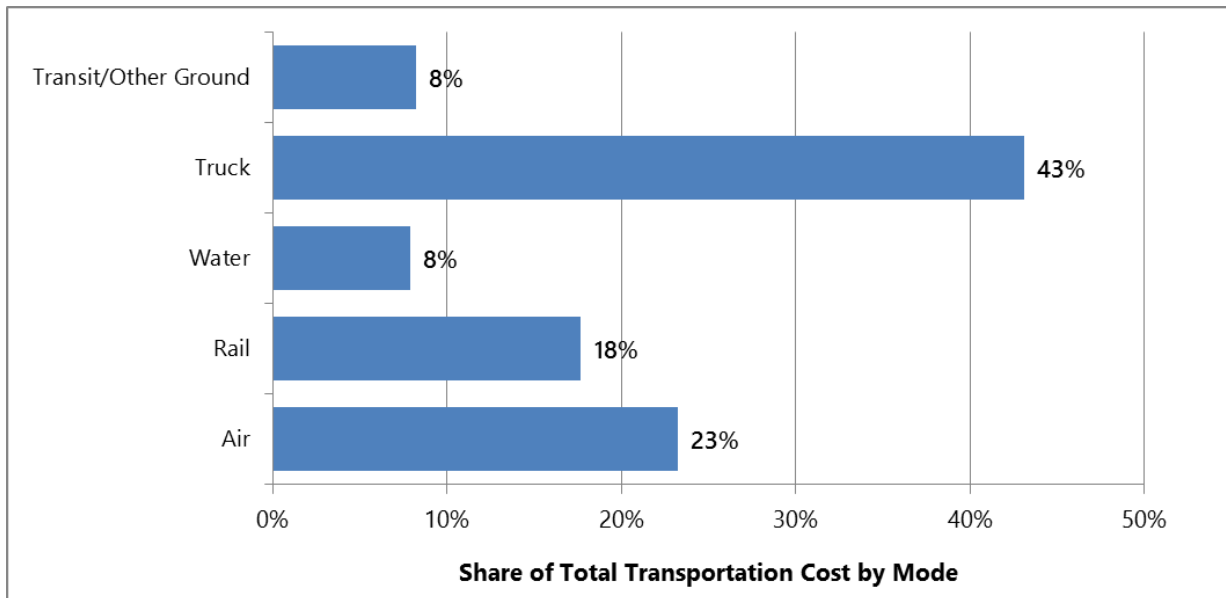


SOURCE: IMPLAN and PNW Economics, LLC

Transportation Infrastructure Need

For getting goods to market and other transportation expense, Figure 10 makes it clear that Anchorage’s Industrial Traded Sectors greatly rely on Trucking. On average, 43% of all transportation expense for Industrial Traded Sectors is Trucking, with Air (23%) and Rail (18%) transport second and third-most important in terms of business costs.

Figure 10 – MOA Industrial Traded Sectors Transportation Expense by Mode



SOURCE: IMPLAN and PNW Economics, LLC

All transportation infrastructure is necessary for Anchorage’s Industrial Traded Sectors, but road and highway transportation access should continue to be a key, high-priority need for industrial site development and business expansion.

The above information is a summary of average utilities and transportation mode expense for all Anchorage Industrial Traded Sectors. But among individual identified sectors, utilities expense and transportation expense do vary in magnitude and relative importance.

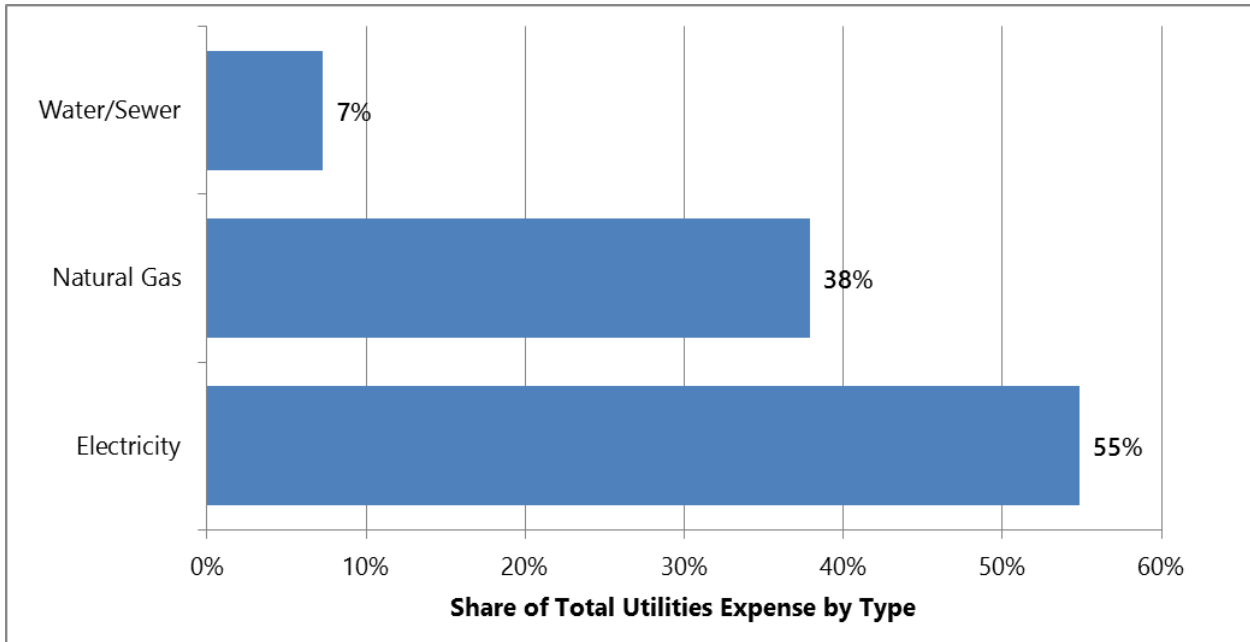
The following pages discuss both utilities and transportation infrastructure need, in terms of proportionate expense, for each individual Industrial Traded Sector.

Transportation Infrastructure & Utilities Need: Manufacturing

Utilities Usage

The Manufacturing businesses among the Industrial Traded Sectors tend to utilize all major utilities, not unlike the broader sector group. But as Figure 11 indicates, Anchorage’s Manufacturers count Natural Gas as a significantly more important utility in terms of business expense (38% of total utilities costs) along with Electricity (55%). Water/Sewer expense is basically consistent with the rest of the Traded Sectors identified.

Figure 11 – MOA Manufacturing Traded Sectors Utilities Usage by Type



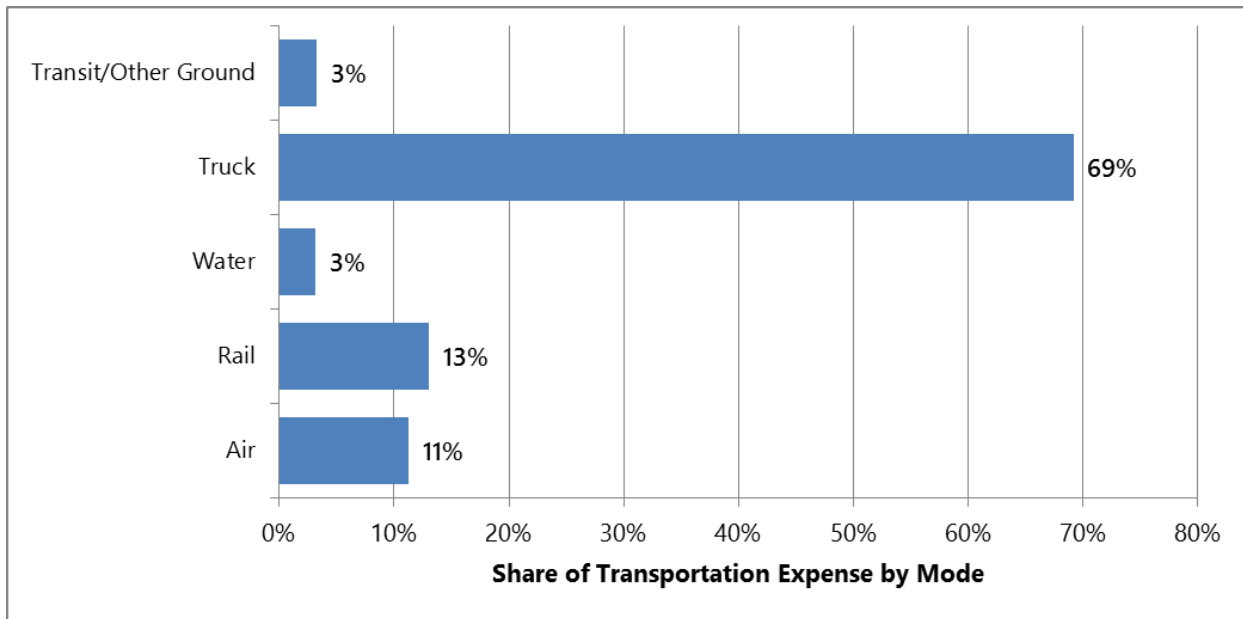
SOURCE: IMPLAN and PNW Economics, LLC

Access to sufficient electrical power for key business operations will be important to Manufacturing sector growth and site need, but sufficient Natural Gas provision is more important to these businesses than the broader Industrial Traded Sector group.

Transportation Infrastructure Need

Anchorage’s Manufacturers rely more significantly on Trucking compared to other Industrial Traded Sectors according to findings summarized in Figure 12. A full 69% of business costs for Manufacturers is in Trucking ground transportation, followed by Rail (13%) and Air (11%).

Figure 12 – MOA Manufacturing Traded Sectors Transportation Expense by Mode



SOURCE: IMPLAN and PNW Economics, LLC

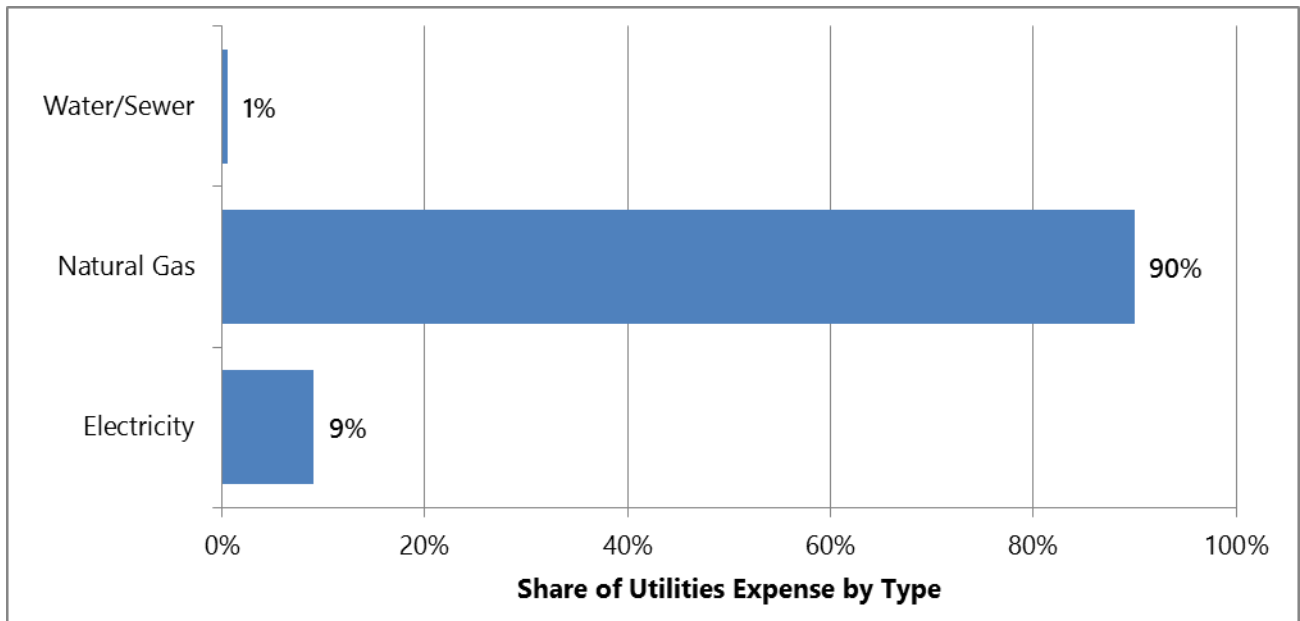
For planning industrial land and site need for this Traded Sector, sufficient road and highway transportation access will be particularly crucial. For some, likely larger product Manufacturers with Rail Belt-oriented customers, Rail access will be important.

Transportation Infrastructure & Utilities Need: Power Generation

Utilities Usage

The Power Generation sector is unique in that primary business function does involve a value-added production function. That is, power generation is the singular function of the enterprise and thus a combination of different utilities is not really required, unlike for Manufacturing, as expressed in Figure 13. Results greatly reflect the usage of natural gas to generate electricity in Anchorage.

Figure 13 – MOA Power Generation Traded Sectors Utilities Usage by Type

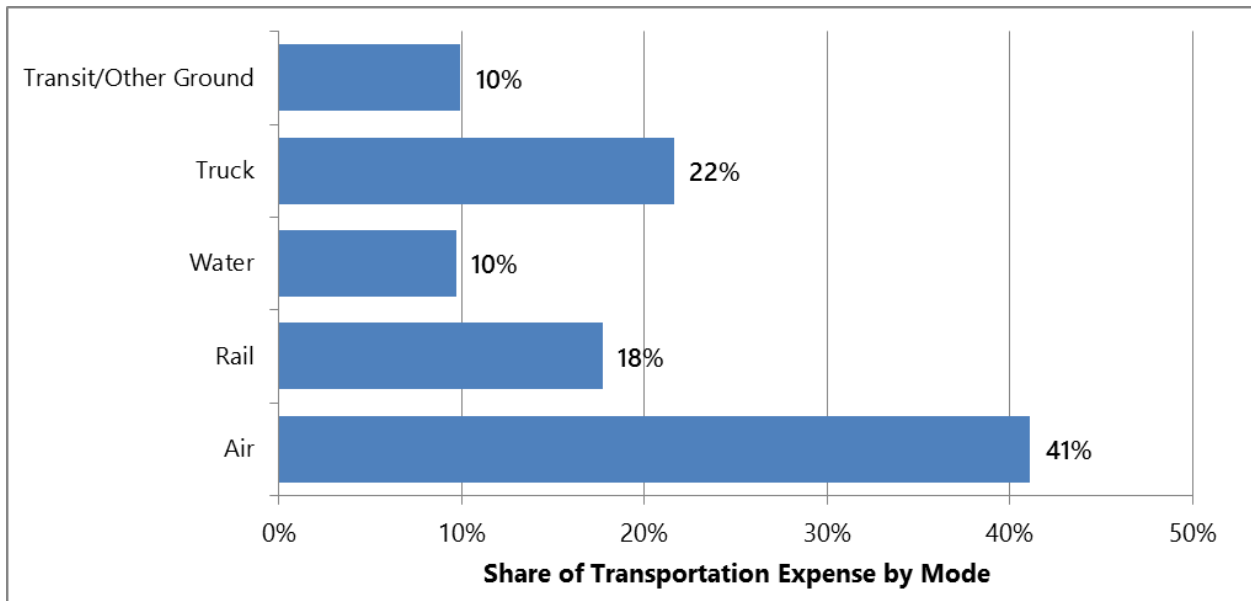


SOURCE: IMPLAN and PNW Economics, LLC

Transportation Infrastructure Need

The Power Generation production function is also different regarding transportation expense. Air transport cost is the highest among transportation expenses (41%) compared to Trucking (22%) which is a significantly higher expense for the other Traded Sectors. Rail (18%) is unusually important in terms of expense for Power Generation as well.

Figure 14 – MOA Power Generation Traded Sectors Transportation Expense by Mode



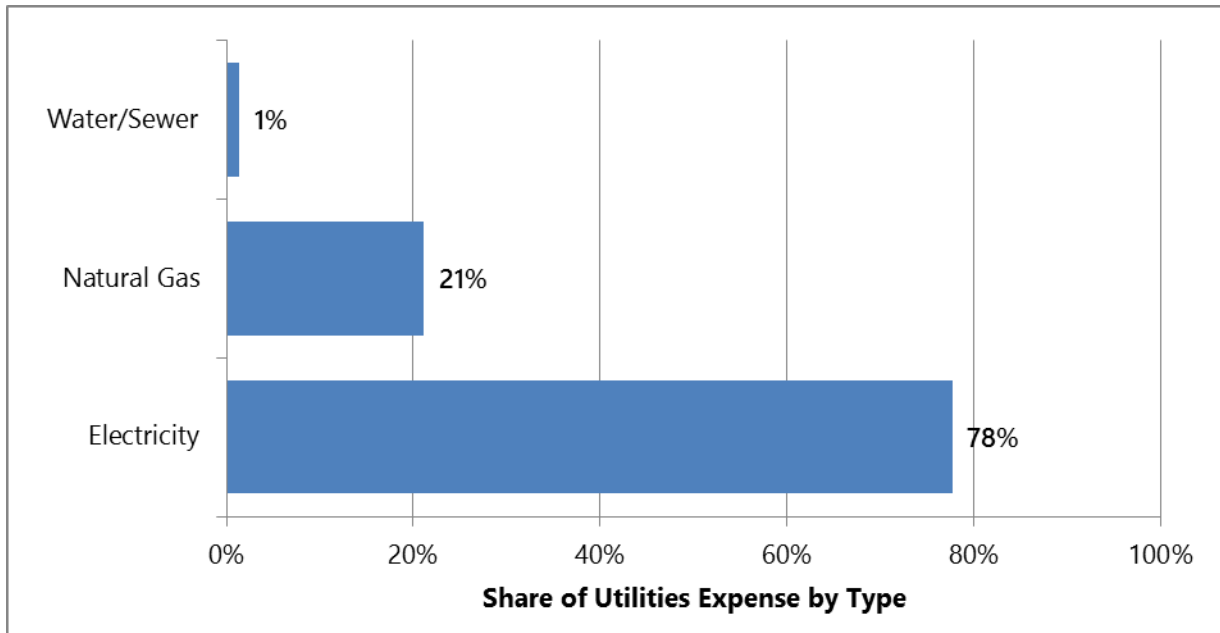
SOURCE: IMPLAN and PNW Economics, LLC

Transportation Infrastructure & Utilities Need: Non-Metallic Mineral Mining

Utilities Usage

This Industrial Traded Sector requires significant Electricity capacity based on its relative utilities expense (78%), followed by Natural Gas need (21%). For actual mining activities, on-site mineral resources are by definition absolutely crucial, but future utilities extension and provision will have priority reflecting findings in Figure 15.

Figure 15 – MOA Non-Metal Mining Traded Sectors Utilities Usage by Type



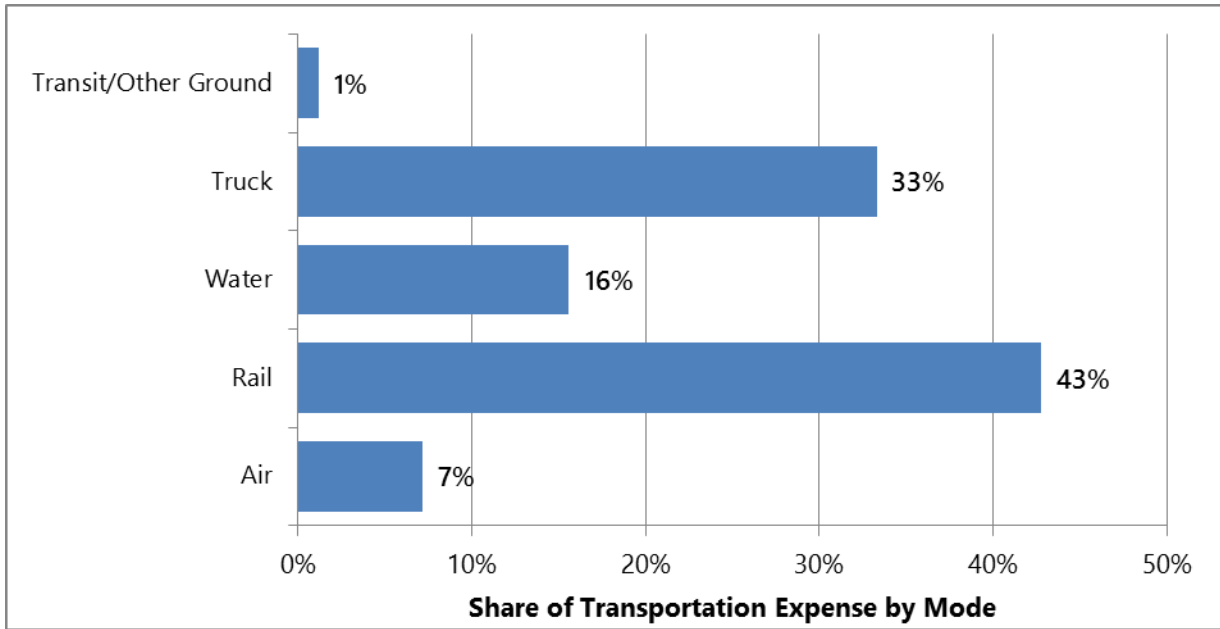
SOURCE: IMPLAN and PNW Economics, LLC

Transportation Infrastructure Need

Rail (43%) and Trucking (33%) are by far the most significant transportation needs and expense for this Traded Sector, due in no small part to the bulky nature of sector products. Waterborne transportation (16%) is also important, and certainly more so than for the other Industrial Traded Sectors.

Rail access extension and road/highway access will be extremely important for any future expansions and land need by the sector.

Figure 16 – MOA Non-Metal Mining Traded Sectors Transportation Expense by Mode



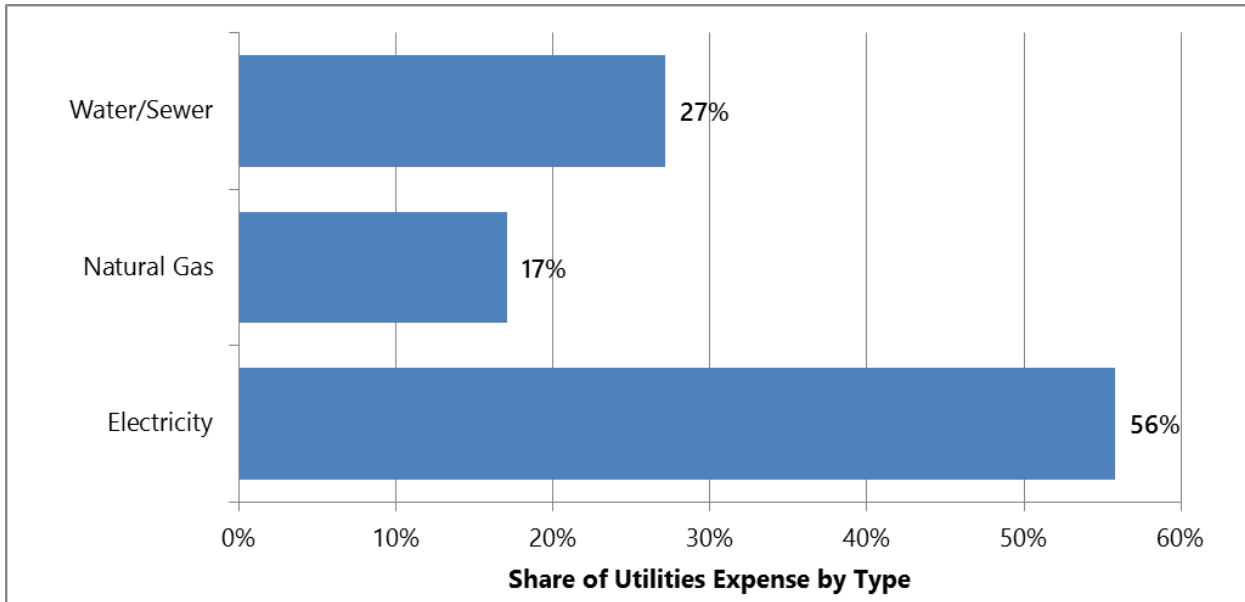
SOURCE: IMPLAN and PNW Economics, LLC

Transportation Infrastructure & Utilities Need: Transportation

Utilities Usage

Identified Transportation Traded Sectors utilize far more Water/Sewer (27%) than the broader Industrial Traded Sector group. Electricity expense (56%) is commensurately lower for the sector, with Natural Gas usage (17%) basically consistent with average usage among the Traded Sectors. Results for Anchorage’s Transportation Traded Sector are found in Figure 17.

Figure 17 – MOA Transportation Traded Sectors Utilities Usage by Type

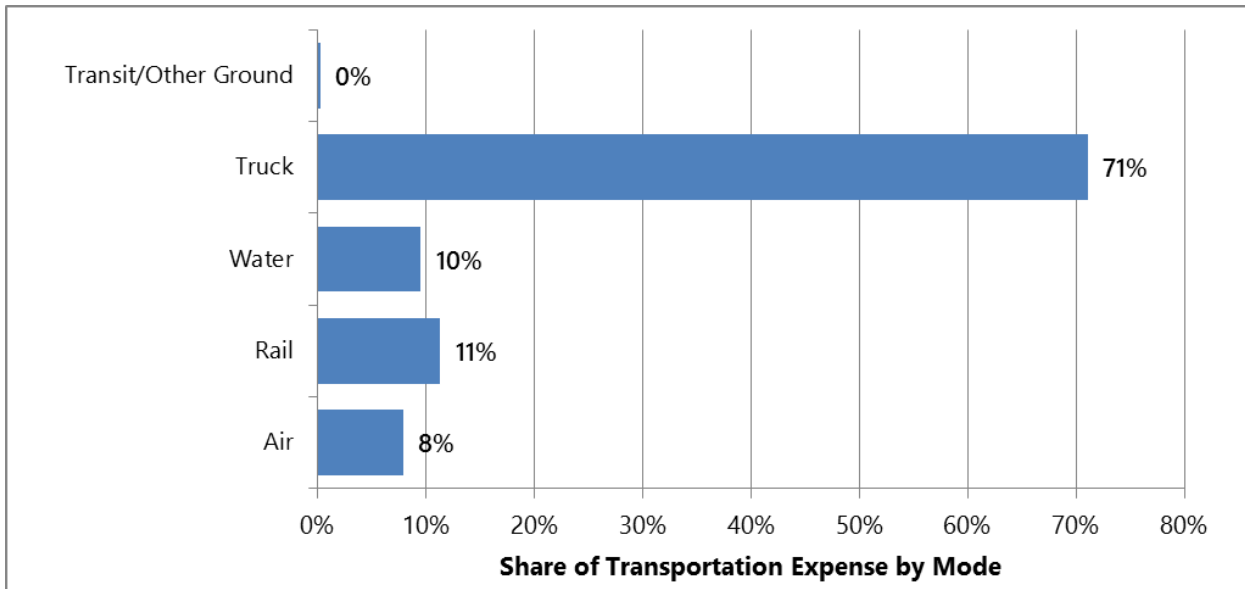


SOURCE: IMPLAN and PNW Economics, LLC

Transportation Infrastructure Need

Figure 18 provides a summary of proportionate transportation expense by business in the Transportation Traded Sector. Unsurprisingly, Trucking-related expense is by far the largest for the sector. However, Air, Rail, and Waterborne definitely have importance as should be expected.

Figure 18 – MOA Transportation Traded Sectors Transportation Expense by Mode



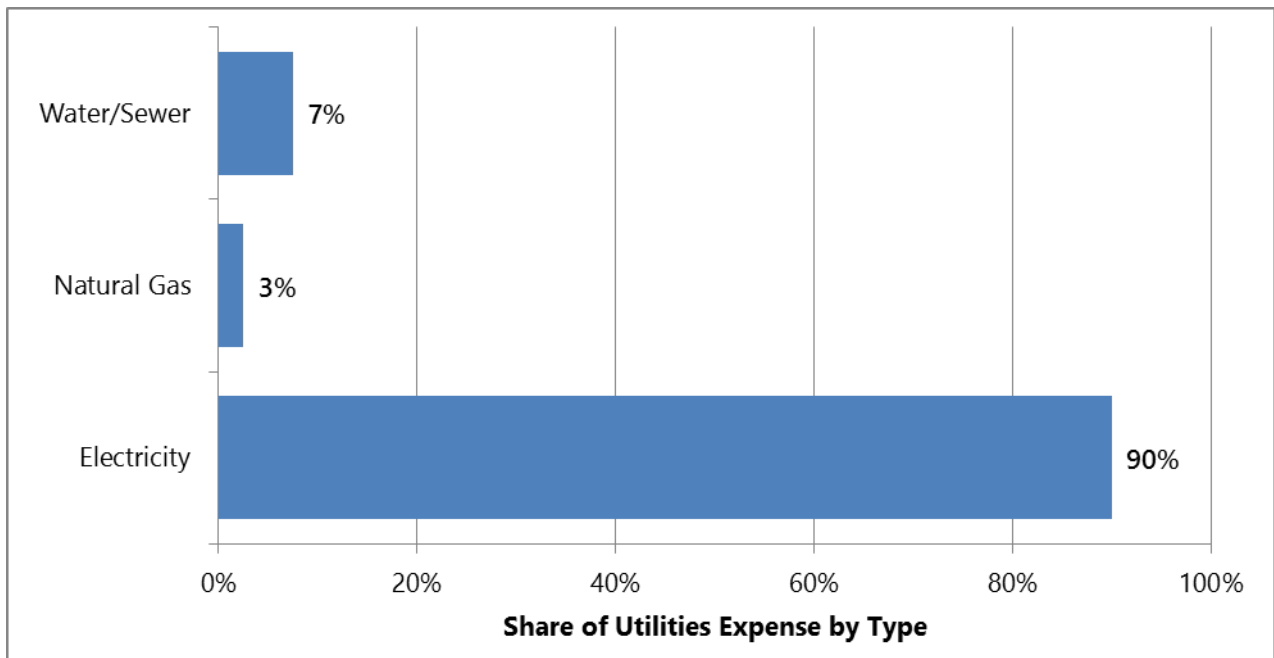
SOURCE: IMPLAN and PNW Economics, LLC

Transportation Infrastructure & Utilities Need: Professional & Technical Services

Utilities Usage

Electricity (90%) is by far the largest utility expense for Professional & Technical Business Services firms in the Traded Sector, more so than the broader Industrial Traded Sectors as a whole. Natural Gas (3%) in contrast is least utilized in terms of expense. Water/Sewer is definitely necessary, but given that the sector is specialized-labor intensive and not as dependent upon utilities for a production process, it is less of a crucial cost item compared to Electricity.

Figure 19 – MOA Professional/Technical Services Traded Sectors Utilities Usage by Type

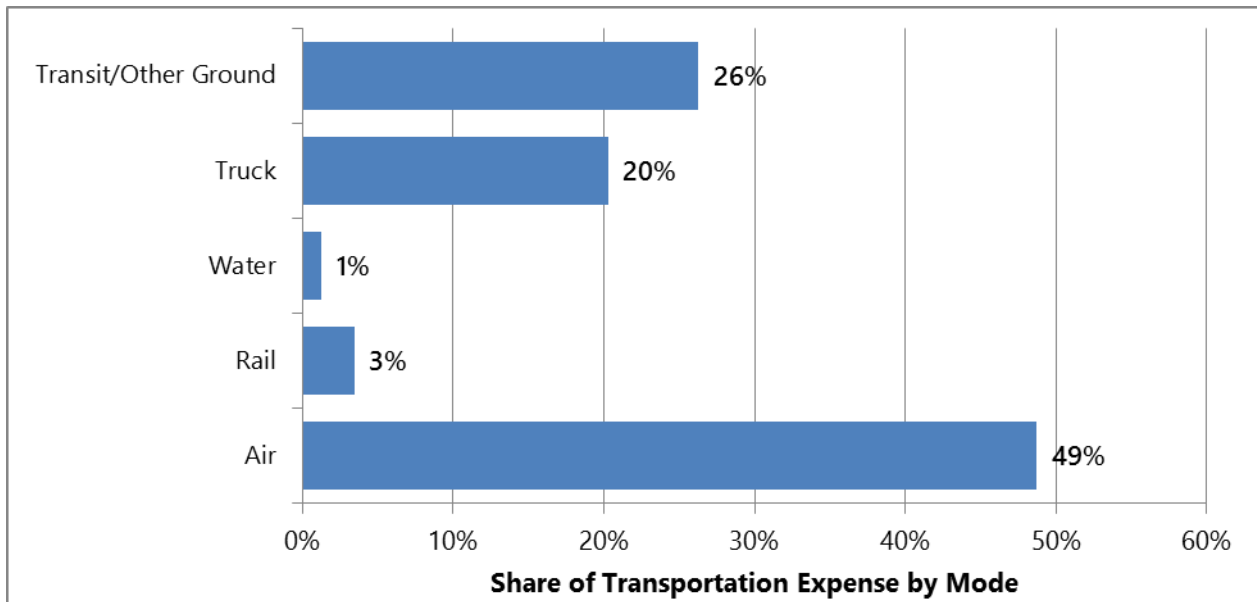


SOURCE: IMPLAN and PNW Economics, LLC

Transportation Infrastructure Need

Figure 20 provides a summary of relative transportation expense for businesses in the Professional and Technical Business Services Traded Sector. The frequently office-oriented light industrial space usage by the sector – with significant personnel and labor expense – is reflected in both the Transit/Other Ground Transportation expense (26%) and Air (49%). Trucking is still important at 20% of transportation expense and use.

Figure 20 – MOA Professional/Technical Services Traded Sectors Transportation Expense by Mode



SOURCE: IMPLAN and PNW Economics, LLC

V. Planning for Industrial Traded Sectors

With detailed information about Anchorage’s Industrial Traded Sectors, it is then appropriate to describe the economics behind different development and redevelopment pressures within the Municipality that will affect the availability of land and sites for these key industries.

This section provides treatment of Municipality land use economics and the fiscal contribution of different uses, including Industrial Traded Sectors, for purposes of comparing and informing future decisions about land use based on balancing competing demands for different uses.

Development Economics of Different Major Land Uses

Introduction

With identified 20-year undersupply of land for each major land use identified by the Municipality, long-range land use planning in Anchorage will inherently be a balancing act between demands for land and sites that share desirability for competing, different uses.

This section of the report provides a summary of the economics behind what different major land use types seek and require of land and sites to be feasible, and therefore what the root causes are for conflicting demand for sites.

The information is in great part a summary of more detailed discussion found in the 2012 Anchorage Commercial Land Assessment, specifically Chapter VII, Development and Redevelopment Economics Issues. That report includes an overview of broad issues, as well as examples of development pro formas, or financial feasibility analysis of competing use types for

different types of sites around Anchorage – and why one use can “outbid” or see feasibility when other use(s) cannot.

Economic Needs of Specific Uses

The primary reason for why some uses will develop on sites that are originally zoned and intended for a different use has to do with how much that use is able to pay for the land in question. The higher a use can afford to pay for a site, the more likely it is to “outbid” other uses and develop profitably. This can be due to a number of things, particularly the following:

- A site is equally suitable for two different uses, and so the user that can afford to pay more will buy and develop, sometimes requiring entitlement change; and
- A site’s development costs are abnormally high, rendering it infeasible to the zoned use, while another use that can afford to absorb the costs can successfully develop and will.

In the case of the latter, the 2012 Anchorage Commercial Land Assessment demonstrated that soil issues such as peat moss under land zoned for Industrial in the South “C” Street area renders industrial development too expensive, while Retail can afford to take on the cost of peat removal and other soil quality and engineering site costs.

All things equal, commercial uses – particularly Retail – can afford to pay more per-acre for land than any other use. This ultimately sets up its competition for land by uses that cannot pay as much or even seek to pay as little as possible for land.

To better understand this dynamic, Figure 21 provides a general comparison of the major business cost categories for the development and operation of built improvements. Industrial, Retail, Office, and Residential are displayed. For each, the following cost categories are displayed in terms of their relative magnitude for development and operations:

- Land;
- Structure;
- Equipment;
- Labor; and
- Utilities.

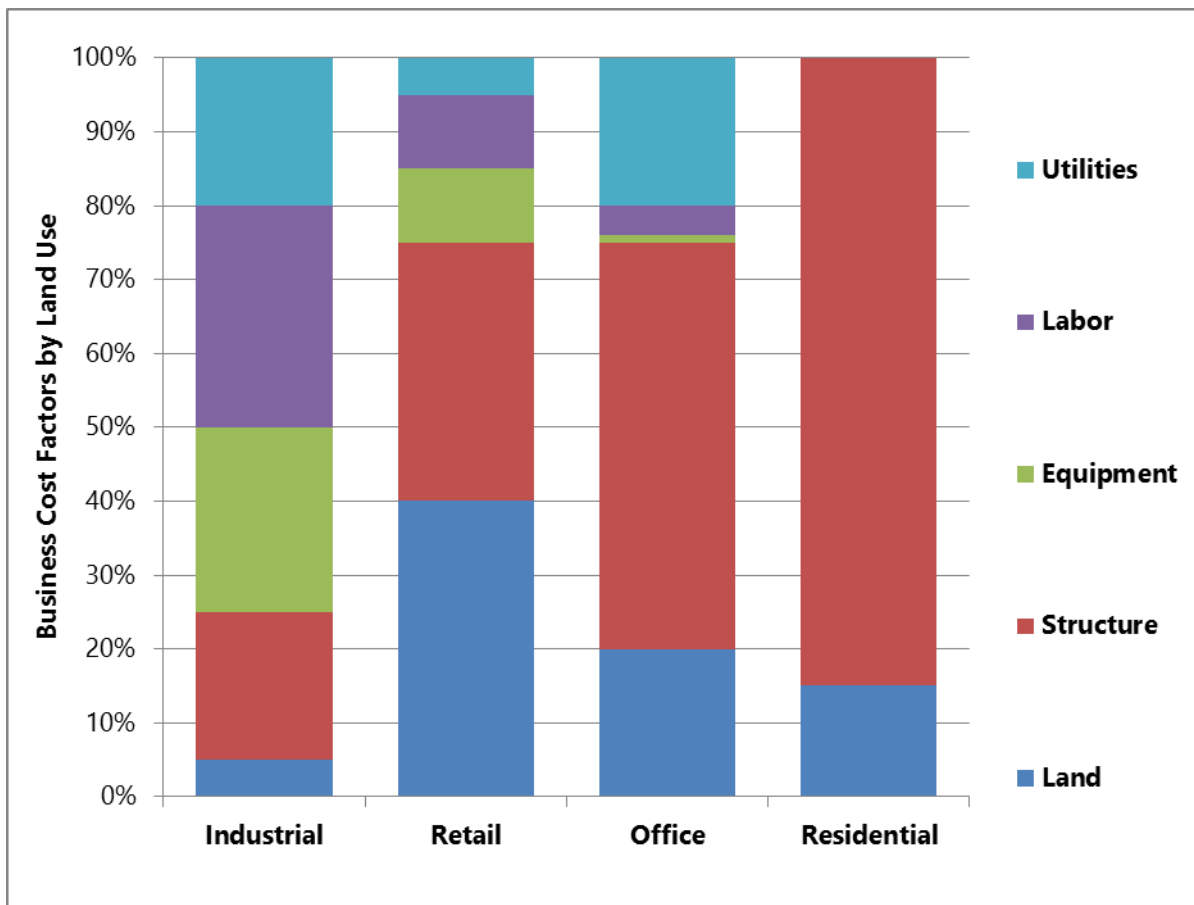
Industrial Development

Operations costs are expensive. Labor costs are higher due to required skills and training. Equipment is frequently expensive and specialized for the function of the business, not to mention depreciates quickly and must be replaced with various frequency. Utilities costs are frequently high due to power need, especially for Manufacturing. Structures can be expensive, depending upon the nature of the business requiring it. *As a result, users seek least-cost land to be economically feasible.* And unlike the other uses, Industrial space is uniquely utilized by each business inside with its equipment and business function so it cannot build up in stacked floors, like Office. *This further constrains the ability for Industrial to pay as little as possible for land.*

Retail Development

Labor is significantly lower-cost than for other uses. Equipment costs are not as specialized and as expensive as for Industrial businesses, but on-hand merchandise does represent an on-site cost. Because of no energy-intensive production, storage, or other business function, utilities costs to Retail are lower than for Industrial. But Retail requires attractive, attention-getting, higher-cost structures. They also strongly prefer to be near highly visible, higher-traffic sites and preferably nearby other commercial development. *Retail, therefore, generally pays the highest premium for land to meet its high-visibility, high-traffic customer need.* And because it relies heavily on major transportation access by customers, it can be in direct conflict with Industrial demand for the same site that also needs high-capacity freight traffic capability.

Figure 21 – Comparison of Business Costs Affecting Development by Major Land Use



Office Development

Office development, particularly in Anchorage, is built to be speculatively leased by various businesses that cannot or do not want their own land and structure. As such, operations costs for Office operations are not significant. Utilities, for climate control and then power for office users, is the primary operations cost. Labor is limited to building management, and equipment is usually minimal.

Because Office development houses businesses greatly needing space for employees and work stations, instead of heavy equipment or merchandise, Office can build up vertically in multiple, nearly identical floors. Buildings must be attractive with high finish for a variety of professional firms, and as heights increase, construction costs per square foot and gross generally do also as the building must accommodate increasing geotechnical engineering stability as well as accommodate structured parking. Office development is also most common and enjoys greater demand when it is near other Office or Retail uses in a commercial or employment corridor or center. *For this reason, Office will pay somewhat of a premium for land, but not as much as Retail due to greater structure cost than Retail.*

Residential Development

Occupied by households, costs for Residential uses are generally limited to structure and land. For each Residential unit – single-family or multifamily – development cost is highest for the structure due to the need for the unit to be market-successful, attractive, and livable for the purchasing or renting household. Given prevailing market prices for other housing units, newly developed units can then only pay so much for land due to the greater unit structure costs.

Like Office development, multifamily Residential development can build up in nearly identical, stacked floors. And like Office, as this happens, the cost of the structure tends to increase per square foot and gross due to both geotechnical engineering and construction typology (wood frame in low-rise and up to steel beam and concrete for high-rise), as well as the need for on-site, structured parking. *Residential, therefore, can pay somewhat of a premium for land as it transitions to taller forms like Office. But it is more constrained by structure cost and parking cost in the face of households who are far more cost-sensitive and have far more choices for where to live than do businesses seeking Office locations.*

Summary

The upshot of different development economics:

- In a land-constrained environment, uses that must pay a premium for land location (Retail, Office) can afford to pay more for a site that would otherwise be a much lower-cost use (Industrial) if supply were not constrained.
- Retail and Industrial are the most dependent upon nearby, higher-capacity roads infrastructure and are usually pitted against one another.

Figure 22 provides a summary of how different major land uses react to increasing land costs given the economics behind each as described above.

Both Retail and Industrial uses are important for the community, but as the next section of this report finds, Industrial development – and Office - deliver higher public return for the Municipality.

Figure 22 – Rising Land Costs & Effects on Development by Major Land Use

	Industrial	Retail	Office	Residential
Tolerance for higher land costs:	Low	High	High	Moderate
Can it Build Up?	Little	Moderate	High	Moderate
How much?	2-Story	3-4 Story	High-rise	Multifamily 3+ stories
Typical reaction to high site cost:	Relocation to expand	Build up	Build up	Build up
Comments:	Cannot stack capital equipment or operations and have low tolerance for increasing traffic congestion	If building up is not a format option, can realize higher sales per square foot with less-optimal number of stores	Will build up provided magnitude of space demand at market lease rates justify costs, including parking	Must spread higher land cost across more residential units to pencil. However, attached housing is an appealing product for minority of households and usually must be rather expensive to justify development costs including parking

Fiscal Implications of Different Major Land Uses

The previous section demonstrated that all things equal, Retail uses will pay more if not the most for land than any other use due to the inherent nature of Retail operations. And with constrained land supply, as is increasingly the case in Anchorage, some uses can “build up” to mid-rise or high-rise structures while Industrial specifically cannot.

This raises the questions:

- *Given different land cost criteria and different abilities to invest in higher-density, more expensive structures (or not), what uses ultimately contribute greater tax revenue to the Municipality given site investment?*
- *How might that inform the fiscal balance that needs to be struck by the Municipality with a fixed supply of land?*

To answer these questions, an analysis of taxable assessed market value of both of business site parcels, structures, and taxable business equipment was conducted for six different parcels with representative Industrial, Office, and Retail uses within the Municipality of Anchorage:

- A Manufacturing Traded Sector property on 0.5 acres of I-1 zoned land;
- A Manufacturing Traded Sector property on 13.6 acres of I-1 zoned land;
- An Industrial Business Park-Using Traded Sector business on 0.5 acres of I-1 zoned land;
- An Office-Using Traded Sector property on 3.1 acres of B-3 zoned land;
- A Medium-Sized Format Retail property on 1.6 acres of I-1 zoned land; *and*
- A Large-Sized Format Retail property on 16.3 acres of I-1 zoned land.

Figure 23 displays the resulting analysis of the representative sample of uses. Property data was provided by the Municipality of Anchorage.¹⁰

Figure 23 – Taxable Assessed Market Value of Different Anchorage Land Uses

User/Land Use	Site Zoning	Site Size (Acres)	Structure		Assessed Value (000s)				
			(Sq. Ft.)	FAR*	Land	Building	Equipment	Total	Per Acre
Industrial									
Manufacturing Traded Sector	I-1	0.5	7,771	0.36	\$138.7	\$896.4	\$738.6	\$1,773.7	\$3,614.1
Manufacturing Traded Sector	I-1	13.6	66,180	0.11	\$4,657.8	\$7,154.0	\$9,882.6	\$21,694.4	\$1,598.5
Business Park-Using Traded Sector	I-1	<u>0.5</u>	<u>12,169</u>	<u>0.54</u>	<u>\$272.8</u>	<u>\$1,245.4</u>	<u>\$163.7</u>	<u>\$1,681.9</u>	<u>\$3,285.6</u>
Industrial Averages:		4.9	28,707	0.34	\$1,689.8	\$3,098.6	\$3,595.0	\$8,383.4	\$2,832.7
Office									
Office-Using Traded Sector	B-3	3.1	97,820	0.73	\$2,629.4	\$12,471.5	\$4,239.1	\$19,340.0	\$6,323.1
Retail									
Retail Medium Format	I-1	1.6	14,545	0.20	\$1,293.9	\$1,794.6	\$1,524.1	\$4,612.6	\$2,819.9
Retail Large Format	I-1	<u>16.3</u>	<u>154,642</u>	<u>0.22</u>	<u>\$9,211.0</u>	<u>\$13,606.5</u>	<u>\$11,393.9</u>	<u>\$34,211.4</u>	<u>\$2,092.5</u>
Retail Averages:		9.0	84,594	0.21	\$5,252.5	\$7,700.6	\$6,459.0	\$19,412.0	\$2,456.2
Traded Sectors Averages:		4.4	45,985	0.44	\$1,924.7	\$5,441.8	\$3,756.0	\$11,122.5	\$3,705.3

SOURCE: Municipality of Anchorage and PNW Economics, LLC

*Floor Area Ratio

Key findings:

- Market data bear out the analysis in the previous section: on a gross and per-acre basis, Retail development and Office development are associated with higher-value land than Industrial development.
- Gross structure value is highest for Office development and Retail development, but on a per-acre basis, Office and some Industrial uses are have higher value than some Retail.
- Gross taxable business equipment value is highest for Large Retail and one of the Manufacturing Traded Sectors, but on a per-acre basis, it is highest for Office.

There is variation among the different users under each category for this analysis. But in general, individual users with highest site investment value are in the Retail category, followed by a Manufacturing Traded Sector user, and then the Office-using Traded Sector.

But on a per-acre basis, measuring investment intensity and value density:

- Office has the highest investment value by far, but Industrial Traded Sector users have higher taxable assessed property value than Retail in this analysis.

¹⁰ Property tax account data utilized in this analysis is publicly available information. For emphasis on data analysis while avoiding singling out the identity of individual properties as part of a policy discussion, all details of each property are not included. Information about the properties can be made available by Municipality of Anchorage Long Range Planning staff upon request.

- *Comparing Traded Sectors regardless of use to Retail, Traded Sector taxable investment value is roughly 50% higher per acre than Retail development.*

In general, this is greatly due to the efficiency of use of each parcel by Office and Industrial development. With less surface parking per acre and greater FARs, structure investment, and taxable equipment per acre, the Traded Sector Office and Traded Sector Industrial users provide greater fiscal benefit to the Municipality than Retail uses in this analysis.

Paired with the fact that Traded Sectors were documented in Figures 3 and 4 to pay substantial wages compared to Retail jobs, the Municipality has a significant fiscal interest in maintaining its land inventory for Traded Sectors from both a taxable assessed value perspective, as well as for maintaining jobs that pay higher and enable households to afford housing in a cost-challenged environment such as Anchorage.

VI. Policy Implications & Recommendations

This section of the report applies information learned about Anchorage Industrial Traded Sector characteristics to future growth in Anchorage as part of the Anchorage Land Use Map Update planning effort. Traded Sector future employment growth, land need, and land use qualities are identified to provide context for quantity and location of land Anchorage should consider for maintaining and encouraging the core of the Municipal economy.

Traded Sector Industrial Land Need Quantity and Quality

Anchorage Broad Traded Sector industrial land need through 2040 is estimated at 492 gross acres Municipality-wide and including Marijuana-related industry. But within that gross land need projection are quite varying sector land needs from size and shape, to sensitivity to surrounding uses, to various utility and infrastructure requirements.

Figure 24 provides a profile of preferred land and site qualities and requirements for the five primary Industrial Traded Sectors identified for the Municipality of Anchorage and their identified production functions and business cost equations. Other specifications are based on findings from the 2015 Anchorage Industrial Land Assessment Update process and industry best practices as well as recent project experience by PNW Economics.

Figure 24 – MOA Traded Sectors Baseline Industrial Land Need Forecast, 2015-2040

Industrial Land/Site Quality	Manufacturing	Power/Transmission	Non-Metallic Mining	Transportation	Professional/ Business Services
Site Size	Single User: > 0.5 Acre Multiuser >1 acre	Single User: > 3 Acre	Single User: > 5 Acre	Single User: > 0.5 Acre Multiuser >5 acre	Single User: > 0.5 Acre Multiuser >1 acre
Site Shape	Square to Rectangle	Square to Rectangle	Square to Rectangle	Square to Rectangle	Square to Rectangle
Site Zoning	Light to Heavy Industrial	Light to Heavy Industrial	Heavy Industrial	General Industrial	Light Industrial
Slope	Minimal	Minimal	Minimal	Minimal	Minimal
Wetlands	None/Mitigated	None/Mitigated	None/Mitigated	None/Mitigated	None But Adjacent Acceptable
Utility Easements	None	None	None	None	None
Sewer (Main Access)	Within 200'	Within 200'	Within 200'	Within 200'	Within 200'
Water (Main Access)	High Capacity within 200'	Within 200'	Within 200'	Within 200'	Within 200'
Electricity (Distribution Line Access)	13 kV or less	13 kV or less	13 kV or less	13 kV or less	13 kV or less
Natural Gas Usage	Significant	Minimal	Moderate	Minimal	Moderate
Local Road Access	Good/Direct	Good/Direct	Good/Direct	Good/Direct	Good/Direct
Transportation System Mobility	Important	Important	Crucial	Crucial	Important
Proximate to Rail	Moderate to Crucial	Moderate	Crucial	Crucial	Minimal
Proximate to Waterborne	Moderate	Minimal	Moderate	Moderate	Minimal
Proximate to Air	Moderate	Moderate	Minimal	Moderate	Crucial
Sensitivity to Nearby Commercial Use	Moderate	High	High	Moderate	Low
Desire Visibility	Varies	Minimal	Minimal	Minimal	Moderate
Building Floor Area Ratio	0.32 - 0.36	0.17 - 0.19	0.15 - 0.17	0.17 - 0.19	0.23 - 0.26
Industrial Land Demand to 2040	Up to 52 Acres	Up to 50 Acres	No Net New	Up to 200 Acres	Up to 110 Acres

- **Site Size:** For single-user, a one-half acre parcel is the preferred minimum size for site flexibility of use. For multiuser sites, 1 to 5 acres is preferable depending upon the use with Transportation requiring more impervious surface generally.
- **Site Shape:** Industrial land and sites must have square to rectangle shapes to maximize site flexibility for building footprint, location, and transportation system access.
- **Site Zoning:** The majority of land demand among Traded Sectors is expected to be uses that can site Heavy Industrial-zoned land, with the key exception Professional & Business Services.
- **Slope:** Industrial building pads must of course be level, but sites can have some slope with tiered building development.

- Wetlands, Utility Easements: Minimal on-site reductions to developable area are desired, though with Professional & Business Services, adjacency to wetlands/water feature can be a marketable amenity.
- Sewer Main Access: All Traded Sectors within the Anchorage market area assumed to require sanitary sewer access. This is particularly true of Manufacturing and Professional/Business Services. Access to a within 200 feet would be desirable.
- Water Main Access: Access to a main within 200 feet is generally desirable, though Manufacturing can require proximity of higher capacity water depending upon what is manufactured.
- Electricity: Proximity to a 13 kilovolt (kV) or less distribution line is desirable.
- Natural Gas Usage: Manufacturing of various types is the primary user of natural gas beyond building heating.
- Local Road Access: Location with a reasonably direct access from a site to an arterial roadway is desirable.
- Transportation System Mobility: Traffic volume as a percentage of capacity should generally be lower to attract industrial uses due to need for regular and dependable freight shipment.
- Proximate to Rail: Rail is generally required by heavier, bulkier, or very high volume cargo load. In Anchorage, some manufacturing may require rail (final assembly of machinery or structure parts before shipment for example), but the majority of need will be from Transportation-related firms that are involved in processing containerized freight through the Port of Anchorage and transporting via rail as opposed to trucking.
- Proximate to Waterborne (Transportation): Most demand for land will be from firms that are part of the Port of Anchorage/containerized cargo redistribution and shipment elsewhere in the State.
- Proximate to Air: Professional & Business Services utilizes Air far more significantly as a percentage of business cost than other Traded Sectors, though much can be expected to be employee traffic as well as freight. Location adjacent to an airport, therefore, is not necessary but reliable drive time to the airport is desirable.
- Sensitivity to Nearby Commercial Use: Traded Sectors that generate significant truck traffic are generally far more sensitive to encroaching commercial uses and the traffic that they generate. Conflicting and worsening traffic patterns and volume are the primary concern.
- Desire Visibility: Manufacturing with an on-site retail component, such as Beverage or Food Manufacturing, as well as some industrial business park users in the Professional/Business Services sectors can require some visibility to non-industrial traffic.

- Building Floor Area Ratio: FARs are taken directly from the 2015 Anchorage Industrial Land Assessment Update.

Industrial Traded Sectors & Land Supply Reconciliation

To approach potential policy issue regarding industrial land and key Traded Sectors, a reconciliation of expected land need and supply, for Industrial Traded Sectors, and non-Traded Sectors demand is required. Sufficiency of land by key sectors, other industrial sectors, location, and varying assumptions about land inventory can provide context to specific policy concepts.

Figure 25, then, gives a final accounting of the sufficiency of industrially-zoned land within the Municipality of Anchorage and Chugiak-Eagle River for accommodating Traded Sector growth, as well as non-Traded Sector growth.

Figure 25 – MOA Traded Sectors Land Need Accounting (Acres), 2015-2040

Anchorage Industrial Land Need Factor	Bowl "High Range"	Bowl "Low Range"
Anchorage Bowl Buildable I-Zoned Supply 1/	385.3	231.6
- Gross Traded Sector Land Need to 2040 2/	<u>383.7</u>	<u>383.7</u>
= Anchorage Bowl Net Traded Sector Capacity	1.6	(152.1)
+ Chugiak-Eagle River Buildable I-Zoned Supply 3/	<u>198.3</u>	<u>187.4</u>
= MOA I-Zoned Capacity Net of Traded Sector Need	199.9	35.3
- Non-Traded Sector Gross Land Need to 2040 4/	<u>185.2</u>	<u>185.2</u>
= 25-Year Net I-Zoned Land Capacity	14.7	(149.9)

1/ 2015 Anchorage Industrial Land Assessment Update Volume I, Figure 4-1

2/ Figure 6

3/ 2015 Anchorage Industrial Land Assessment Update Volume I, Figure 4-2 less Anchorage Bowl inventory Figure 4-1

4/ Figure 6

Two estimates of Anchorage Bowl industrially-zoned land capacity are compared: "High Range" and "Low Range" as described in the 2015 Anchorage Industrial Land Assessment Update: Volume II. Essentially, "High Range" differs from the "Low Range" by the optimistic inclusion of small "bread crumbs" industrial parcels of small size and irregular shape throughout the Bowl, as well as other parcels of unverifiable suitability as industrial development.

Key Findings:

- The optimistic "High Range" inventory of I-zoned land in the Anchorage Bowl is barely able to satisfy Traded Sector demand (1.6 acres remaining by 2040).

- The more realistic “Low Range” inventory of I-zoned in the Anchorage Bowl is only able to satisfy 60% of Traded Sector land need (152-acre deficit), relying heavily on Chugiak-Eagle River inventory.
- Under the more optimistic “High Range” Anchorage Bowl inventory, 25-year growth in all industrial needs will barely be accommodated (14.7 acres remaining in 2040), requiring significant reliance upon development-readiness for lands in Chugiak-Eagle River.
- Under the more realistic “Low Range” inventory of I-zoned and in the Anchorage Bowl, the Municipality has insufficient land for all industrial need through 2040, with an estimated deficit MOA-wide of 149.9 acres.

Industrial Land Policy Implications

Policy Concept Choice Relationships

Given the upshot of the reconciliation of Traded Sector & Non-Traded Sector Industrial Land Demand and documented capacity, Figure 26 provides a comparison of the possible combinations of policy implications for Anchorage to meet land need through 2040. The figure provides policy combination scenarios depending upon:

- The choice to rezone candidate PLI and T zoned lands (as identified in 2015 Industrial Lands Assessment report) to meet industrial land need; as well as
- “High Range” vs. “Low Range” Bowl Inventory validity.

Key Findings:

- Choosing to avoid rezoning candidate Public Land Institutional and/or Transition Lands (as identified in 2015 Industrial Lands Assessment) will require the need to enhance industrial land inventory in Anchorage via stronger protections such as industrial sanctuary designations, greater restriction on commercial uses for I-zones, and potential rezones from commercial to industrial within the Anchorage Bowl.
- Choosing to rezone candidate PLI and T lands in Anchorage will significantly help meet the need of Traded Sector growth within the Anchorage Bowl under the “High Range” Bowl Inventory, as well as alleviate the need for more restrictive industrial land protections.
- Rezoning candidate PLI and T lands under the “Low Range” Bowl Inventory is not sufficient for Traded Sector growth, leaving a 152-acre deficit that will require some industrial zone enhancements within the Anchorage Bowl.

Figure 26 – MOA Industrial Land Policy Combinations & Outcomes

		High Range Bowl Inventory	Low Range Bowl Inventory
Rezone Candidate PLI, T Lands	<i>Anchorage Bowl</i>	Potential need to rezone some PLI, T Acres (1.6 acres of Bowl land in 2040)	77 rezoned PLI, T acres insufficient, leaving a 152-acre Traded Sector deficit
	<i>Chugiak-Eagle River</i>	Chugiak-Eagle River infrastructure needed for land to meet <u>total</u> need	Chugiak-Eagle River infrastructure needed to help meet <u>Traded Sector</u> growth
	<i>Potential Policy Changes</i>	Bowl I-Zone enhancements possibly needed (14.7 acres remaining in 2040)	Bowl I-Zone enhancements necessary to help meet need in Anchorage
Do Not Rezone Candidate PLI, T Lands	<i>Anchorage Bowl</i>	No PLI, T lands rezoned	No PLI, T lands rezoned
	<i>Chugiak-Eagle River</i>	Chugiak-Eagle River infrastructure needed for land to meet <u>total</u> need	Chugiak-Eagle River infrastructure needed to help meet <u>Traded Sector</u> growth
	<i>Potential Policy Changes</i>	Bowl I-Zone enhancements likely needed (14.7 acres remaining in 2040)	Bowl I-Zone enhancements crucial to help meet total need

- Under most circumstances, Chugiak-Eagle River will need to be ready to receive some Traded Sector and/or Non-Traded Sector growth through 2040 and will thus require infrastructure and utility planning and provision.

Industrial Traded Sector Policy Conclusions

The reconciliation of supply and demand estimates for the 2040 Land Use Plan Map Update process definitely indicates need for a various combination of policies to at the very least meet the industrial land needs of key Traded Sectors at the core of the Anchorage economy.

The scenario rubric in Figure 26 should be viewed as a policy discussion guide to help staff, elected officials, and citizens consider community planning outcomes from an industrial land and industry sector perspective. An industrial land deficit can be expected for Anchorage through 2040 for most economic scenarios unless the optimistic “High Range” Anchorage Bowl inventory is realized, or unless Anchorage realizes 25 years of unprecedented economic stagnation.

Even then, the purpose of industrial land planning is to enhance the economic vitality of the community for growth of family-wage jobs and to prevent such a poor economic showing. Some combination of rezoning of lands in the Bowl and investment in Chugiak-Eagle River industrial land infrastructure, and enhancement of retention of I-zoned lands and the sanctity of their industrial uses is highly probable under most scenarios as a result.

Moving forward, it is recommended that the Municipality of Anchorage adopt policies that recognize the key Traded Sectors in its economy in support of the following findings:

- Traded Sectors are crucial to the Anchorage economy as they are responsible for bringing business revenue and income into the local economy from outside of Anchorage.
- The Oil Industry remains a key example: Oil production is greatly exported outside of Alaska, but in turn firms and employees spend significantly within Anchorage at higher-than-average incomes, supporting many other local businesses and sectors. For this reason, weakness in this Traded Sector has a disproportionate impact upon the broader economy that is well understood by the local community.
- Traded Sectors are the industries that are at the core of the economy upon which many others depend. Local recessions and boom cycles are nearly always driven by a Traded Sector that in turn causes ripple effects to other sectors. Oil recessions and booms, air transportation/travel recession (as after 9/11) and growth are examples.
- Because Traded Sectors bring significant revenue and income from outside of a region, per capita they tend to pay higher than most other sectors, particularly retail and personal services. Traded Sector jobs contribute to housing affordability, and provide disposable income upon which retail and services sectors depend.
- Traded Sectors also represent high return on high public investment in air, marine, rail, and road transportation infrastructure from Anchorage to the rest of the State as well as domestic and foreign markets.

For all of these reasons, it is important to both retain and allow the expansion of Industrial Traded Sectors within Anchorage because of the significant economic ripple effects they have for many other sectors including and because of their family-wage jobs. Without the retention and growth of such jobs in Anchorage:

- Average wages in Anchorage will see downward pressure, particularly when commercial retail development encroaches upon and consumes industrial land.
- Overall need for commercial retail development and land is reduced because the jobs supporting higher household spending are deteriorated, along with jobs and household spending from deteriorated dependent sectors.
- With reduced average wages, the economy is more dependent upon lower-paying sectors, which within a housing-deficit environment exacerbates negative pressures on affordable housing solutions.

Given the crucial nature of Traded Sectors, land use and economic development policies should recognize and address the challenges faced by Industrial Traded Sectors, as well as industrial users in general, due to the economics of industrial business land use identified in this report:

- Industrial users overwhelmingly cannot “build up” and expand vertically like an office building or a residential building. Due to manufacturing activity or other specific business function, they generally must expand horizontally and require additional land to grow.
- Because of their high utilities costs, labor costs, and machinery/equipment costs, industrial users generally cannot absorb land cost increases as can other uses that can build up or must be located in high-traffic, high-visibility locations like retail commercial.
- Industrial land and sites should be maintained and ensured for Industrial users to stay and expand in Anchorage.
- This will require some recognition in policy that Industrial land supply is a high priority—or at the very least, land capacity for the key Industrial Traded Sectors is a high policy priority.
- Some trade-offs for retail commercial land need in the Bowl will likely be needed, but Traded Industrial Sector growth capacity can be a priority over other, lower-intensity industrial uses.
- This should include exploration of incentives that facilitate private development of industrial uses. Incentives should be considered to help reduce costs related to redevelopment of industrial sites that retain and intensify industrial uses, as well as help address such items as off-site costs like road or utilities extension are cost-inhibitive to development feasibility, particularly in the Chugiak-Eagle River area.
- A balance of rezoning candidate PLI and T lands to industrial uses will be required with varying protections of existing industrial areas and sites, and investment in major infrastructure for Chugiak-Eagle River will be essential.

