Anchorage Industrial Land Assessment Update: Volume II

Industrial Lands Inventory

Municipality of Anchorage

Community Development Department
Planning Division

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Industrial Lands Inventory

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Executive Summary

1. Study Objectives

Volume II of the Anchorage Industrial Land Assessment characterizes the existing and potential industrial lands in Anchorage and Chugiak-Eagle River, their acreage and distribution, and the predominant industrial and commercial activities in industrially zoned areas.

The Municipality of Anchorage (MOA) teamed with Cardno, Inc., to provide an updated assessment of industrial land sufficiency within the Anchorage Bowl and Chugiak-Eagle River areas. This is a technical study that comes as the MOA recognizes industrial lands as a key asset in growing and diversifying the regional economy.

This document is the second of three volumes of the study. It updates and refines the inventory of industrial uses and buildable land supply, in order to inform municipal policy regarding industrial land use and economic development. Volume II does the following:

1. Defines the industrial sectors and land use context in Anchorage;
2. Inventories existing land use activities on industrial lands; and
3. Estimates the remaining land supply available for industrial development.

Its findings enable Volume I of the study to compare the industrial land supply with a forecast of projected industrial land needs in the MOA. Volume I then identifies potential strategies to address the supply of industrial land.

This study includes the Anchorage Bowl, Chugiak-Eagle River, and major landholdings in the MOA not currently zoned for industrial use but that are subject to speculation regarding their potential. Additional data from the lands inventory process is provided in appendices. Meeting summaries from the Anchorage Industrial Land Assessment Advisory Committee are provided as an appendix at the end of Volume II. Volume III provides the dictionary of the land use classification system that the Planning Division employed to overhaul the city's inventory of industrial uses.

Volume II fulfills the purpose of the Industrial Land Assessment to improve the community's understanding of Anchorage's industrial lands and sectors. It is a source of information for public officials, planners, real estate developers, industrial firms and investors, and economic development specialists. The movement to inform an industrial land strategy for Anchorage comes in the context of other needs in the overall land use system for residential, commercial, and other uses. Volumes I and II will help to inform efforts by the community to balance and reconcile the competing and yet interdependent land needs in the MOA over the long term.

2. Study Area

The Industrial Lands Inventory examines the areas that are currently industrial or are subject to speculation about future industrial potential in the Municipality. The study area encompasses industrial zoning districts, areas designated for industrial use in the Comprehensive Plan, non-industrial zoning district areas that have a concentration of industrial uses or that intermingle with industrial districts, and, lastly, undeveloped landholdings in the Municipality that are not currently designated for industrial use but, according to some observers, may at least in some part, have future industrial potential. The study area does not include the Turnagain Arm or Girdwood.

Special study areas within the Industrial Lands Inventory that are not currently zoned industrial include the landholdings of the municipal Heritage Land Bank (HLB), Joint Base Elmendorf-Richardson (JBER), Ted Stevens Anchorage International Airport (TSAIA), the Alaska Railroad Corporation, as well as the Fire Island landholdings of CIRI, and Chugiak-Eagle River landholdings of Eklutna, Inc., Native Village Corporation, and others. The Anchorage Industrial Lands Assessment examines these areas to help the community understand their likelihood and extent of availability for industrial development over the next 20 years. It also helps inform the community about the functions, operational constraints, and land needs of the owner institutions.

3. Land Use Context

Anchorage has a variety of activities that make up its land use system. Because the urbanized land area is limited, there is competition over space for housing, businesses, and other uses. These land use activities are interrelated in that they support and impact one another. To be successful, a city provides space for a diversity of important activities.

Industrial production, distribution, and repair activities are a part of that balance. They include economic driver sectors and local industrial support to other economic sectors. Industrial sectors supply a high proportion of family wage jobs and locally owned businesses. They also diversify the local economy to become more resilient through changing economic cycles. In context of the pressures to convert the use of industrial parcels to commercial retail and other uses, a predictable and sustained supply of industrial land on the market is essential for retaining and attracting industrial uses in the local land use economy.

Modern industrial uses are defined by being engaged in the activities of making, moving, and maintaining goods and equipment. These industrial "production, distribution, and repair" (or "PDR") uses include manufacturing, goods handling and transportation, and repair and maintenance service categories of industrial use. Production category uses include manufacturing, power generation and construction contracting enterprises. Small- and medium-sized manufacturers are widely recognized for their disproportionate contribution to jobs and innovation, exports and economic growth.

Distribution category industries include wholesale activities, ground freight trucking, warehousing, and especially the major airport, marine, and railroad transportation facilities. The prevalence of distribution category PDR uses reflects Anchorage's position as a transportation hub and support center for economic activities taking place elsewhere in Alaska and the region. Repair category uses are integral to the industrial economy and share land use characteristics and needs with the production and distribution enterprises. Characteristic needs of industrial "PDR" uses include:

- Accessibility to customers, suppliers, workers, and road networks.
- Affordable, low rents per square foot.
- Clustering of similar industries and supplier and service networks.
- Separation or buffering from incompatible residential and mixed-uses.
- Large, flexible indoor spaces in low-rise or single-story buildings.
- Adequate parcel size with space for freight vehicles and equipment.

Some non-industrial land use activities share physical characteristics with industrial PDR uses, although they are not industrial PDR functions. For example, car dealerships, bulk goods retailers, and self-storage leasing are space intensive and occupy a significant share of the industrial land base; however, they do not function as industrial production, distribution, or repair firms.

The inventory of existing industrial uses for this study cross-references the North American Industrial Classification System (NAICS) of economic sectors with the PDR industrial categories conceptualized above.

4. Findings as to Existing Industrial Land Use

Excluding the city's major airport, railroad, and port transportation facilities, the *Production* category of local industrial uses, led by *manufacturing* and *natural resource production* sectors, is the largest industrial land user in the Municipality, in terms of area. These two production sectors utilize approximately 420 acres of industrial-zoned land, and 520 acres total including non-industrial zones. Most manufacturers are a variety of small- to medium-sized establishments.

The Production category also includes the power generation and water *utilities* and *construction* contracting enterprises, both of which are prevalent in the Municipality. *Construction* contractors—e.g., heavy construction, special trades, and machinery related—occupy 330 acres total, and are the third-largest user of industrially zoned land among all local industrial sectors. Contrary to expectations at the outset of the study, very little of the land used by the construction sector is for materials laydown yards. Most of the space is used for parking, storage, and maintenance of work vehicles and equipment, as well as company offices and assembly/work areas.

Excluding the major airport, railroad, and port transportation facilities, the *Distribution* category of industrial uses, led by the *ground transportation services* sector, is the second largest user of local industrial zoned land among the major industrial categories. *Ground transportation services* —trucking and freight services, delivery services, towing, taxi, and other transportation services— utilizes approximately 430 acres of industrial zoned land, and 500 acres total including non-industrial zones. The *warehousing* sector, while not as prevalent in Anchorage as in some cities, is still among the top 10 industrial PDR sectors for land area in the Municipality. The *wholesale trade* sector occupies 190 acres and rounds out the *Distribution* category of industrial PDR uses.

For the *Repair* category of industrial PDR uses, the *vehicle and equipment repair* sector is a relatively major user of industrial land in the Study Area, occupying approximately 120 acres of industrial land and 150 total in the Study Area. The greatest land user among the Repair category sectors is *waste management services*, including solid waste disposal facilities, snow disposal sites, and salvage yards. This sector occupies approximately 580 acres when including the regional landfill in Eagle River.

Summary Table I. Acres in Use by Industrial Sector
Anchorage Bowl and Chugiak-Eagle River, 2013-14

Industrial Sector	Industrial Districts	All Districts in Study Area
Production	880	1,320
Manufacturing and Non-metallic Mineral Products	420	520
Utilities – Power, Water and Wastewater	150	470
Construction	310	330
Distribution (Airport, Railroad, and Port Facilities)	930	3,640
Distribution (Ground Transportation, Wholesale, and Warehousing)	620	710
Ground Transportation and Freight Services	340	400
Wholesale Trade	190	210
Warehousing	90	100
Repair	340	790
Vehicle and Equipment Repair	120	150
Services to Buildings and Facilities	50	60
Waste Management, Salvage, and Snow Disposal	170	580

Non-industrial users also compete for industrial zoned land. In particular, the industrial land base in the Anchorage Bowl has in recent years experienced increasing pressure by non-industrial uses as the city's overall land supply has become tighter. The three non-industrial sectors occupying the most industrial zoned land in the Municipality include: *vehicle sales and heavy goods retail* (260 acres); *self-storage, leasing, equipment rental* (160 acres, including 100 acres in self-storage); and *general retail* (120 acres).

Summary Table II. Acres of Industrial Land in Use by Non-industrial Sector, 2013-14

Non-industrial Economic Sector	Industrial Districts
Retail Trade	380
General Retail	120
Vehicle Sales and Heavy Goods Retail	260
Finance, Real Estate, Leasing, and Self-storage	190
Finance, Insurance, and Real Estate Services	30
Leasing and Equipment Rental	60
Self-storage (including outdoor and mini-storage)	100
Business and Professional Services	110
Professional and Business Services	80
Communications and Information	30
Leisure and Accommodations	90
Education and Health Services	80
Personal and Other Services (except repair)	70
Government and Public Safety	70
Residences	50

Some industrial zoned areas have more non-industrial uses than others. Major non-industrial users are often concentrated in certain areas that have evolved as commercial centers in spite of industrial zoning—such as in Abbott Town Center or Northway Town Center, and along certain segments of C Street and Old Seward Highway. Other uses, such as fitness clubs, martial arts studios, and churches, are distributed more evenly through the industrial districts.

Using a conservative measure of existing non-industrial space utilization of I-1 and I-2 land, the Industrial Lands Inventory estimates a 37 percent utilization rate on industrial zoned lands by non-industrial uses in the Anchorage Bowl. It estimates a much lower, 6 percent utilization rate in Chugiak-Eagle River. The non-industrial utilization rate takes into account that a certain amount of the employment even in these commercial categories is in industrial-type activities.

5. Findings as to Industrial Land Supply – Anchorage Bowl

The Anchorage Bowl has between 130 and 230 acres remaining of buildable, industrial zoned land that likely to be available for future industrial development. This range estimate considers site constraints to development (environmental and utility service constraints), removes parcels committed to a future planned non-industrial use, and factors in the rate of non-industrial utilization of industrially zoned lands in the Bowl.

The high-range estimate of 230 acres includes small parcels not considered optimal for medium-size local establishments. It also includes lands with partial or significant environmental constraints, which may be more expensive and difficult for industrial users to develop. Lastly, it includes some parcels of questionable future availability.

The low-range estimate of 130 acres includes only "Tier 1" parcels that have a minimum one-acre size that can accommodate a majority of local industrial enterprises, that have no environmental constraints, and that are anticipated to receive water and wastewater service. However, even the low-range estimate may in some ways overstate the supply of industrial land. It includes several large sites that may experience greater site-specific pressure to convert to commercial use because of their locations. The finding that there is a very limited supply of industrially zoned land remaining in the Bowl corroborates the many comments and observations from dozens of industrial business owners, managers, and employees that have informed this study.

The majority of the industrial zoned acreage consists of small infill parcels of between a half acre and several acres in size, scattered across the industrial districts primarily in Central and South Anchorage. A handful of large vacant sites remain in the I-1 and I-2 land supply, the largest being 38.6 acres in Central Anchorage. Aside from a cluster of medium-sized vacant lots north of 64th Avenue in Central Anchorage, most medium to large sites remaining in the Bowl are located in South Anchorage.

In addition to industrial zoned sites, Anchorage has approximately 80 to 160 acres of land zoned PLI and T available for industrial development. These lands include four large tracts of Ted Stevens Anchorage International Airport land that will be available for long-term leases for non-aeronautical uses, the municipally owned former Native Hospital site, and a JBER parcel northeast of the Boniface Parkway and Glenn Highway intersection which may someday transfer to Eklutna, Inc., depending on the future outcome of a three-party land agreement.

The estimate of industrial land supply does not include lands that are committed to future public utility operations, military operations, or airport, port, or railroad transportation operations. These facility lands mostly meet and exceed the projected land needed for the public utility and airport, railroad, and port transportation facility sectors.

Summary Table III. Buildable Acres of Industrial Land in Anchorage Bowl, 2014

	I-1	I-2	Industrial Districts Total	PLI	T	All Districts Total
High-Range Estimate:	150	80	230	70	90	390
Includes constrained lands, parcels less than 1 acre, and lots of uncertain availability.						
Low–Range Estimate	65	65	130	70	10	210
Includes only unconstrained lands on parcels 1 acre or larger considered available.						

The buildable acres above include vacant, partially vacant, and marginally used lots. Redevelopment potential for a higher intensity use on existing developed lots was addressed in a different way.

Many industrial lots have few improvements: a low floor-to-area-ratio (FAR) and a low building-value-to-lot-value-ratio (BLVR). However, most of these lots are in fact fully utilized by the business for equipment parking, maneuvering, storage, and maintenance that is integral to the enterprise. Most industrial users cannot build upward above one or two stories. Industrial business function, equipment layout, and resulting space usage generally renders substantial gains in intensity through redevelopment more difficult.

Therefore, this study instead assumes a more gradual increase in average floor-to-area-ratios among industrial uses over the 20-year study horizon. Average FARs of sites developed with buildings increased to above 0.3 FAR in the 1970s and 1980s, but then fell to just over 0.2 FAR in the 1990s and 2000s. Industrial land development since 2010 appears to be trending back toward the higher industrial development densities experienced in the 1970s. Although relatively few in number, these recent developments have averaged nearly 0.3 FAR. Lower parking requirements in the new land use regulations combined with higher land prices and other market factors may contribute to industrial land use becoming more efficient. Volume I of this study builds this assumption into its industrial land demand forecasts (Volume I, page 34).

Among industrial users in Anchorage, manufacturing, wholesale trade, and warehousing achieve the highest FARs, between 0.3 and 0.5 FAR. Construction, transportation, and utilities typically have lower FARs, between 0.1 and 0.2 FAR. The most inefficient non-industrial sector using industrial land is the Leasing, Rental, and Self-storage sector, which achieves only 0.08 FAR on average.

6. Findings as to Industrial Land Supply – Chugiak-Eagle River

Chugiak-Eagle River has approximately 190 acres of buildable, industrial-zoned land capacity for industrial development. The estimate accounts for site constraints to development, removes parcels committed to a non-industrial use, and factors in a localized rate of non-industrial utilization of industrial lands.

The estimate of land capacity in Chugiak-Eagle River is impacted by the lack of wastewater service in its northern communities. The land capacity estimate includes an assumption that parcels unlikely to receive wastewater service during the study time horizon will, on average, develop at only half the intensity of those lots with sewer service. This assumption, which was developed in consultation with the Industrial Land Assessment Advisory Committee, reduced the effective acreage in the Powder Reserve, Birchwood, Chugiak, and Eklutna.

Although substantial tracts of undeveloped lands exist in Chugiak-Eagle River, the estimate of industrial land supply does not include military lands, public utility facility lands, or lands that are determined to be unlikely to receive road access during the planning horizon. Large tracts of Eklutna land west of Mirror Lake and north of the Eklutna Power Generation Plant are seen as unlikely to receive road access within the time horizon, under current trends and policy scenarios. In addition, the Mink Creek wetland tracts, the Eklutna River Estuary, and the Fire Creek Estuary located southwest of Birchwood Airport have recently been placed in conservation easements.

Therefore, only 190 acres of buildable non-industrial zoned land, mostly PC (Planned Community) and T (Transition), is likely be available for industrial development within the planning horizon. This additional land brings the total estimate of land capacity in Chugiak-Eagle River to approximately 380 acres.

Summary Table IV. Buildable Acres of Industrial Land, Chugiak-Eagle River, 2014

	I-1	I-2	Industrial Districts Total**	PC	PLI	T	All Districts Total
Eagle River	30	13	43	0	3	0	46
Powder Reserve *	0	0	0	0	0	121	121
Chugiak with 770 *	6	0	6	56	0	0	63
Birchwood Airport *	19	70	89	0	0	0	89
Eklutna Vicinity *	36	14	49	0	0	11	60
Chugiak-Eagle River Total	**91**	**96**	**187**	**56**	**3**	**132**	**378**

* Land capacity estimate affected by anticipated lack of sewer service through 2035.

** I-3 rural industrial district has 0.1 acres of buildable land.

7. Prohibitively Constrained Lands

In both Anchorage and Chugiak-Eagle River, much of the gross supply of vacant lands is prohibitively constrained from industrial development for at least the next 20 years, based on current growth forecasts and policy trends. In some cases, changes in land use and transportation planning policies and public infrastructure investment priorities would need to take place if these lands were to become available for future industrial use within the planning horizon.

Summary Table V. Prohibitively Constrained Landholdings

Major Landholdings	Prohibitive Constraints
Ted Stevens Anchorage International Airport	Most of TSAIA is encumbered for aeronautical use by FAA regulation, and is not available for long-term industrial leases.
Alaska Railroad Ship Creek Terminal Reserve	The Railroad anticipates it will continue to use the majority of its industrial zoned land for railroad operations. Most of its lease lots are occupied. Its largest vacant properties are zoned for mixed-use redevelopment with offices, retail, and housing.
HLB Parcels west of Minnesota Drive south of Connors Lake Bog	These are natural open space woodland and high value wetlands, and in conservation easements or to become part of a wetlands mitigation bank.
Laurel Acres Subdivision (small lot portion)	This is a "paper plat" without roads or utilities, in undeveloped wetlands, with many property owners.
Fire Island	Fire Island is located approximately three miles west of Point Campbell, nearly as far from Anchorage as is Point MacKenzie. Road access is considered unlikely within the study horizon.
Joint Base Elmendorf-Richardson (JBER)	JBER actively uses most of its lands for operations and training. The lands that may seem undeveloped between Anchorage and Eagle River are in fact training areas that are needed to support the base's mission. The base is already 11,000 acres under sized.
Powder Reserve and Eklutna 770 Tracts.	120 acres of Tract B and all 770 acres of Tract C of Powder Reserve are not anticipated to be developed as industrial. Most of the Eklutna 770 Tract is designated for residential use.
Eklutna coastal areas and Fire Creek Estuary	Eklutna, Inc., recently established conservation easements over most of its coastlands and 520 acres in the Fire Creek Estuary area. It has also established a cultural overlay over most of the Eklutna Village area, making industrial development unlikely.
Mirror Lake reserve lands of Eklutna, Inc.	Highway interchange access to this 1,200 acre reserve is not anticipated in the 20-year horizon.

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Section 1 Introduction

This Volume II of the Anchorage Industrial Land Assessment report characterizes the existing and potential industrial lands in Anchorage and Chugiak-Eagle River, their location and distribution, and the predominant industrial and commercial activities today. This industrial inventory updates and refines the land supply analysis from a previous Anchorage Industrial Land Assessment, completed in 2009, to provide updated information designed to help inform decisions regarding what industrial lands should be retained—where and how much. Volume II does the following:

1. Inventories current land use activities on industrial lands, including utility and transportation related uses; and

2. Estimates the remaining industrial land supply available for future industrial development.

Its findings enable Volume I of the Anchorage Industrial Land Assessment to match the industrial land supply with a forecast of projected industrial land demand, out to a planning horizon of year 2035.

This update to the Industrial Land Assessment was recommended by the Anchorage Commercial Lands Assessment, a study about non-industrial commercial land needs completed in 2012. The results of this industrial assessment will advise other municipal planning efforts being undertaken, such as revisions to the *Anchorage Bowl Land Use Plan Map*, and area-specific plans. The study will also help inform decisions on municipal policies, regulations, and strategies that seek to balance the needs of industrial with other essential land uses (e.g., residential, commercial, and institutional).

Volume II begins with a brief introduction to the geographic study area in Section 1. Section 2 provides a background about the local historical and geographic context for industrial development, the reasons why industrial land is considered in municipal land use planning, and the role of industrial activities in the local land use system.

Section 3 explains the methodology for the industrial use inventory and for estimating land supply and its capacity to accommodate future industrial development in context of pressures from other competing uses.

Section 4 inventories and categorizes Anchorage's industrial land uses. It identifies the production, distribution, and repair uses that make up Anchorage's industrial sector, as well as non-industrial uses on industrial-zoned lands; and it discusses the spatial organization and locational characteristics of these uses.

Section 5 provides a quantitative accounting and qualitative description of Anchorage's supply of land for future industrial development, and the spatial

distribution of the industrial land supply in the overall context of the community. This includes lands in the Anchorage Bowl, Chugiak-Eagle River, and elsewhere. This land inventory examines major landholdings in the Municipality that are not currently designated for industrial use but are subject to speculation regarding their potential to contribute future industrial land supply.

Additional data and other information from the lands assessment process is provided in the appendices. Further information about the new land-based classification system that the Planning Division used to update the industrial lands inventory, including a dictionary of use types and guide to field coding, comprises Volume III of the Anchorage Industrial Land Assessment.

Volume II helps fulfill the objective of the Industrial Land Assessment project to build a stronger common understanding of Anchorage's industrial lands and industrial sectors. It is a source of information for public officials, planners, real estate developers, economic development specialists, owners of industrial firms, and potential investors in local industry, and the general public. The report in Volume I of the Industrial Land Assessment considers the findings of this inventory in projecting future industrial land demand, matching the projected demand with available supply, and suggests industrial land strategies that could reconcile industrial needs within the available land supply.

The movement to inform an industrial land strategy for Anchorage comes in the context of other needs for land by residential, commercial, and institutional uses. The Industrial Land Assessment follows equivalent land assessments for residential and commercial sectors, which were completed in 2012. In addition to balancing and reconciling these land needs, the industrial study can support efforts to bring about a better understanding of the industrial uses in context of the overall land use system, including compatibility and contribution to the local economy.

Geographic Study Area

The Industrial Lands Inventory examines existing industrial lands as well as lands subject to speculation about future industrial potential in the Municipality. Its study area includes the Anchorage Bowl and Chugiak-Eagle River, as well as the other major landholdings in the Municipality that according to some observers may, at least in some part, have future industrial potential. Therefore, the study area encompasses the industrial zoning districts, areas designated for industrial use in the Comprehensive Plan, non-industrial zoning district areas that have a concentration of industrial uses, and, lastly, undeveloped landholdings that are not currently zoned or designated for industrial use but which have been the subject of ongoing speculation about their future industrial potential.

Turnagain Arm and Girdwood are not included because their limited and distant industrial land base appears unlikely to accommodate industrial demand beyond the needs of their own communities.

Present industrial zoning districts in the Anchorage Bowl and Chugiak-Eagle River include primarily the I-1 Light Industrial district and I-2 Heavy Industrial zoning districts. Smaller areas are zoned MI Marine Industrial around Anchorage's Port, and I-3 Rural Industrial[1] in Chugiak. Other districts include parts of the PC Planned Community district, and some Public Lands and Institutions (PLI) and Transition (T) zoned lands devoted to airports, ports, railroad, or public utility activities of industrial character.

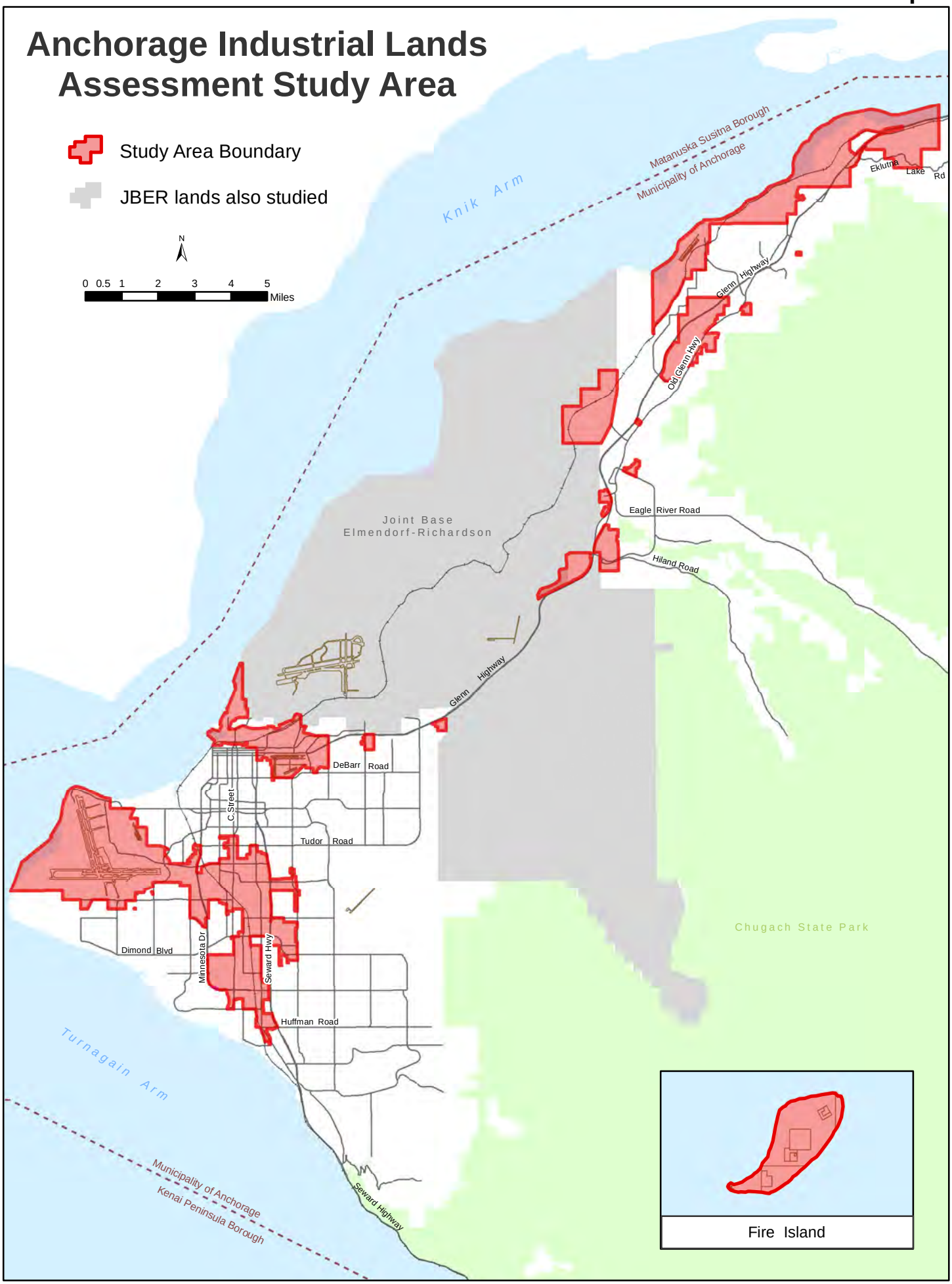
The study area also includes special study areas not currently zoned industrial, such as Fire Island, Joint Base Elmendorf-Richardson (JBER), Ted Stevens Anchorage International Airport (TSAIA) lands, the landholdings of CIRI, Eklutna, Inc. Native Village Corporation, and other areas for which questions have arisen among observers about availability for industrial development. The study seeks to provide answers about the extent and likelihood of availability of these lands for industrial development within the 20-year planning horizon of this land assessment. Regardless whether any part of these large landholdings are found to have tracts that could potentially be put to industrial use, this review of their potential will inform the overall assessment of industrial land supply, and to further inform planners and the public about some of the functions, operational constraints, and land needs of major landholding entities in the Municipality from TSAIA, to JBER, to Eklutna Village.

Lastly, the study area includes commercially zoned areas that adjoin and interact with industrially zoned activities. These include, for example, the B-3 areas that mingle with I-1 and I-2 zones in and around the Abbott Road and 88th Avenue area, portions of the Ship Creek Alaska Railroad Terminal Reserve that are zoned PC (Planned Community) or MC (Marine Commercial), and B-3 (General Business) zoned portions of the Old Seward Highway corridor in central-south Anchorage that intersperse with industrial properties along the corridor. This coverage provides context around the industrially zoned areas, captures inventory data for industrial uses located in these B-3 districts, and addresses any buildable lands in the vicinity of existing industrial areas.

[1]The new Title 21 land use regulations change the acronym for Rural Industrial District to CE-I-3.

Map 1

Anchorage Industrial Lands Assessment Study Area



Section 2 Context

Section 2 provides background about the local historical and geographic context for industrial development, the reasons for conducting the industrial land inventory, and a definition for what industrial activity includes, particularly those activities in Anchorage's land use system.

Historical Industrial Development Pattern

Anchorage's development history helps explain today's industrial land use patterns and helps ground forecasts of what future development patterns may be. The following information is adapted from several studies conducted previously for the Municipality[2].

From its origins in 1914 as the Alaska Engineering Commission's (A.E.C.) field headquarters and supply terminal for construction of the Alaska Railroad, Anchorage's development pattern focused significant and strategic land assets on industrial development—particularly in transportation and distribution. The Ship Creek delta and its straight-line distance and negligible grade from shoreline were favorable for launching railroad construction to the Matanuska coal fields. The flat lowland between the Anchorage Townsite and Government Hill plateaus provided ample room for rail yards, machine shops, and warehouses, as well as the initial construction camp, or "tent city." During the rail construction period from 1915 to 1923, industrial expansion eastward along the Ship Creek basin was flanked by initial residential settlements on Government Hill and the early town of 600 lots on the elevated land to the south. This initial pattern of industrial development along the rail line extends to Merrill Field, the vital airfield commissioned in 1930 to replace the original airstrip constructed in 1924. It supported the primary air and rail movement of both goods and people throughout the state.

At the larger geographic scale, "The Anchorage" at the mouth of Ship Creek and head of Cook Inlet was centrally located on Alaska's Railbelt region. The Port of Anchorage, established initially to support rail construction, experienced stable, incremental growth for nearly 50 years. Relocation of the railroad headquarters to Anchorage from Seward, and flooding in Seward in 1917, solidified the Port of Anchorage as the primary logistics center for Alaska.

The railroad yards and adjoining waterfront have evolved into a complex of maritime, industrial, power utility, distribution, and transportation facilities that today extend for most of the length and width of the coastal basin of Ship Creek.

[2] Patterns of the Past: An Inventory of Anchorage Historic Resources (1986); Anchorage Bowl Commercial and Industrial Land Use Study (1996); Anchorage 2020—Anchorage Bowl Comprehensive Plan (2001); Anchorage Industrial Land Assessment (2009); and the Anchorage Commercial Land Assessment (2012).

As World War I ended in 1918, many pilots made their way to Anchorage to continue flying. The bush pilots and their daily ferrying of goods and people throughout the Alaskan frontier from Merrill Field further enhanced the growth potential of the Port. Moreover, the completion of the rail line linking Anchorage to Fairbanks in 1923 opened a valuable heavy goods transportation link to the Interior. Overall, Anchorage's industrial land and facility supply was able to support these expanded opportunities.

Two significant events led to population increases of over 200 percent during the 1940s and 1970s. The first was the establishment of the Elmendorf Air Force Base and Fort Richardson Army Post in response to increased Pacific threats. During World War II, Anchorage's strategic location made it well positioned for the construction of defense facilities serving the North Pacific Theater of operations. During this period, construction of the Glenn and Alaska Highways gave Anchorage an overland link to the Lower 48. Growth related to the military expansion caused the census documented population to increase from fewer than 3,500 in 1940 to more than 11,250 in 1950. Anchorage's strategic location continued to play a valuable role during the conflicts in Korea, Vietnam, and throughout the Cold War and post-Cold War eras. Today, Joint Base Elmendorf-Richardson remains a vital national security asset. It is a major employment facility, consumer of local business and utility services, and land management unit that constrains the geographic expansion of the Anchorage Bowl and Chugiak-Eagle River civilian community within the Municipality.

As demand for air cargo rapidly grew in the mid-twentieth century because of Anchorage's location advantages as a supply center and air crossroads, Merrill Field's ability to accommodate that demand, and modern aviation technology, reached capacity. At the same time, the Alaska Road Commission was completing the northern terminus of the (Old) Seward Highway, further strengthening Anchorage's role as the regional logistics center for Alaska.

The construction of the International Airport and adjoining airport road and the completion of the (Old) Seward Highway facilitated industrial land development adjacent to these two primary vehicle circulation arterials throughout the 1950s and early 1960s. Since zoning was not then a limiting factor in industrial development, higher, dry land near transportation routes were preferred development sites.

The Good Friday Earthquake and tsunamis of 1964 devastated the Ports of Seward and Valdez. While Anchorage's building stock also suffered significant damage, the Port of Anchorage was able to resume operations within a short period of time. During the years of reconstruction following the earthquake, the population increased very little and few industrial parcels were developed until the construction of the Trans-Alaska Pipeline began in 1975. Following the discovery of petroleum in Prudhoe Bay in 1968, getting Alaskan oil to market became a national imperative. Getting goods and people to construction sites was enhanced through the completion of the Parks Highway from Palmer to Fairbanks in 1971.

While industries such as mining, fishing, fur, and timber helped sustain incremental growth for industrial land use in Anchorage's earliest decades, those industries were waning by the middle of the twentieth century. In the decades preceding construction of the Trans-Alaska Pipeline System (TAPS), construction projects around Alaska sponsored by the federal government were the primary source of demand for industrial land in the Anchorage area.

In the mid-seventies, TAPS construction stimulated several years of rapid economic growth. From 1974 through 1977, a rapid influx of contractors, subcontractors, and materials led to extensive industrial development, particularly in the North and Central Industrial Subareas of the Bowl. Municipal data indicates that nearly 300 industrial parcels were developed from 1975 to 1980, more parcels than in the previous 30 years. The spike in oil prices and state revenues starting in 1979 primed another growth surge. Industrial development continued at a healthy pace over the first half of the 1980s with more than 500 industrial parcels developed through the mid 1980s.

Anchorage's economy became overbuilt, and crashed with the mid-eighties oil price slump. Industrial land development came to a virtual halt during the statewide recession, and only resumed, at a much slower growth rate, in the 1990s. This boom-bust building cycle was devastating to construction related manufacturing and contracting, and suppliers of goods.

Beginning around the time of the Exxon-Valdez oil spill response operations in 1989-1990, Anchorage's economy entered a 20-year period of stable, moderate employment growth. The national Great Recession ended this run; however, moderate growth resumed, with some industrial enterprises anticipating a new era of expansion in the energy sector. However, the availability of development sites in the Bowl has become a limiting factor.

Throughout this history, industrial development in Anchorage has followed a pattern common to industrial expansion elsewhere, in that it has occurred primarily on sites adjacent to infrastructure including arterial roadways and other major transportation facilities, including the port, railroad, and airports.

The industrial road network has developed in a similar fashion to other mid-century industrial areas in the U.S. Older districts have roads that were built for lighter, shorter vehicles and less intensive uses. Newer districts developed wider roads with the ability to accommodate heavier loads and longer trailers. This juxtaposition of old and new infrastructure exists in all industrial subareas of the Bowl.

The regional trucking freight circulation network relies on two highway corridors, the Seward and Glenn Highways. These primary double load (twin trailer and long semitrailer) truck routes serve the entire industrial land supply, including the port, airports, and railroad terminal industrial areas—either directly, or through industrial supporting arterials. The three main supporting double load routes include the International Airport Road connector, the Minnesota Drive/O'Malley Road bypass loop, and Tudor Road/Muldoon.

During the past twenty years, the Northern and Central Anchorage Bowl gradually built out to near full extent, with 80 to 90 percent of the land supply in active use. Bound between the mountains, the military base, and the sea, development in the Anchorage Bowl finally stretched to the limits of its physical boundaries. Industrially zoned lands and enterprises began to experience competition for space from other land uses. In the early 1990s, nearly 1,000 acres of developable industrially zoned land existed in the Bowl. Twenty years later, only 25 percent of this land remains. Many recently developed industrial parcels in the I-1 and I-2 zoning districts indicate a significant shift to commercial retail and other non-industrial uses.

Remaining industrial opportunities are primarily infill. However, as its name implies, the "Bowl" is a lowland between the Chugach foothills and the glacial deposit uplands of Kincaid, Sand Lake, and the International Airport. It is home to numerous natural features including creeks, lagoons, lakes, and wetlands. Many remaining undeveloped parcels are affected by these features. Some of these sites are infeasible to develop or are preserved by law. Other sites are too costly for industrial users to develop because of peat soils, poor parcel configuration, seismic ground failure hazards, previous development, and other marginal conditions. Industrial development is less able than competing commercial land uses to absorb the additional costs to develop constrained sites.

Fire Island, Birchwood, Chugiak, and Eklutna present larger-scale future opportunities with better soil conditions for expanding the industrial land base within the Municipality. However, these areas are constrained to varying degrees by other factors. These constraints include: distance to markets and existing industrial clusters, lack of road access, and no water and sewer services. In addition, the land ownership pattern in these areas requires most potential enterprises to accept ground lease terms instead of fee-simple ownership of a development site.

Why an Industrial Land Inventory

Anchorage has a variety of activities that make up its land use system. Because its land area is limited, and its remaining land supply is constrained, there is competition over space for housing, businesses, and other uses. These land use activities are interrelated—they support and impact one another. So where each occurs is important to the rest. To be successful, a city provides space for a diversity of important activities. The space for each should be adequate and in appropriate locations. Anchorage's challenge is to allocate its land resources to achieve the right balance in new development among these various land use activities.

Industrial distribution, production, and repair activities are a part of that balance. They provide economic driver (basic) industries and local industrial support to other local economic sectors. They are integral to Anchorage's function as a statewide transportation hub. Industrial sectors also provide jobs in STEM[3] fields that are more able to support middle-income wages than are other sectors such as retail. They diversify the local economy to become more resilient through changing economic cycles. In addition, non-industrial commercial businesses need efficient, reliable, and timely access to physical goods and services that industrial businesses provide: hotels need laundry services; restaurants need food wholesalers and equipment suppliers; financial and professional offices need paper and other supplies; and all residential and commercial uses depend on the services of local fabrication, construction, and repair enterprises. There is also an ongoing need for well-located industrial space for the provision of public services, such as street maintenance and transit vehicle parking and maintenance, snow disposal sites, power generation plants, and waste-management facilities. These industrial services support Anchorage's "urban transition" to an era of growth through infill and redevelopment of existing properties to higher intensities. Supporting industrial distribution, production, and repair uses is a mutually beneficial policy with other land use activities in Anchorage.

A lack of appropriate industrial land may limit the community's ability to capture employers, and potentially basic industries that can make a disproportionate contribution to regional income. Loss of urban industrial land supply has been a growing concern in other regions of the country. It is becoming more common in Lower 48 cities to retain and promote urban manufacturing, distribution, and industrial service enterprises as an economic development strategy. More cities today perceive that they lose economic resiliency if they lose their production, distribution, and repair uses to other communities. Because industrial jobs take place in workplaces that require space in the city, these cities have found that the use of land, and the supply and location of land, is essential for retaining these uses in the local land use economy. However, for Anchorage, what is the extent and character of industrial uses in Anchorage, and what is the "right" supply of industrial land to

[3] STEM is the science, technology, engineering, and math fields.

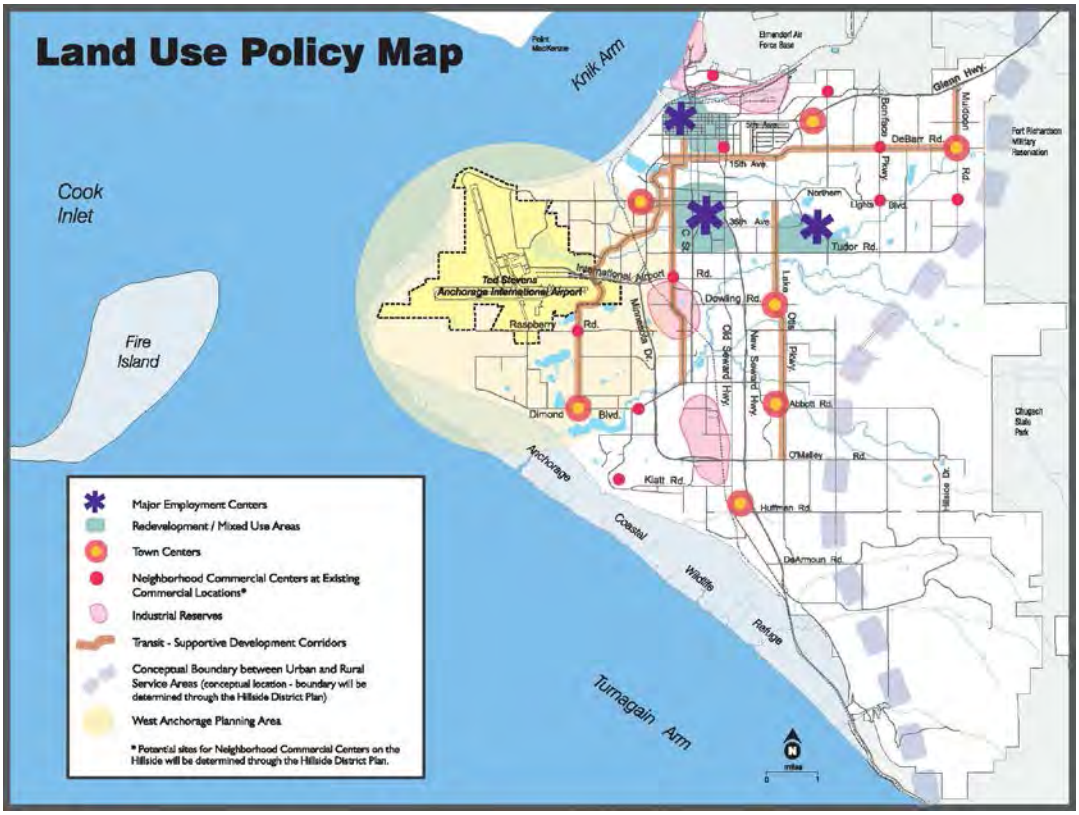
drive and support its growth? How suitable are lands in Chugiak-Eagle River as a place for relocation or expansion of important industrial sectors?

This inventory attempts to help readers understand what uses comprise Anchorage's industrial sector, some of their locational needs, and their remaining land supply—all in context of the pressures to convert the use of industrial parcels to commercial or residential uses. This can lead to determining their functions in the local land use economy. It is also a prerequisite to identifying which industrial uses in Anchorage are its key economic driver industries (aka its "traded sectors"). Understanding the makeup of the industrial land use economy and the status of its land supply can inform municipal land use planning decisions about how to allocate and balance lands among various activities. These decisions may affect how many industrial enterprises grow or disappear, or stay or relocate outside the Municipality.

The Municipality regulates land use to avoid mixing incompatible uses, and protect important uses that have a hard time competing for land and real estate. Its policies and regulations have for decades promoted and protected specific uses. There are specific zoning districts designed to allocate space for office, institutional, and residential uses. There are districts which protect retail commercial centers from industrial uses. However, until recently, there were no equivalent zoning districts designed exclusively to meet the needs of industrial uses. This is because Anchorage's industrial zoning, rather than being exclusive, has been hierarchical: allowing other uses considered less intensive than industrial activities. As a result, office, retail, and residential developers have over the years been allowed to compete for development rights to the remaining industrially zoned land supply. This has become a problem for industrial enterprises, as pressure from other uses has grown stronger in context of the declining vacant land supply. Commercial pressure is often very localized to a particular area. It is stronger in some industrially zoned areas established through areawide rezonings in the 1970s and early 1980s without advance land use planning. Some poorly located industrial zones have proved more conducive to retail commercial use. As a result, industrial users experience a lower effective supply of industrial land, and an increased speculative value of remaining industrial lands which increases overall development costs among industrial users.

In 2001 the Municipality adopted the *Anchorage 2020 – Anchorage Bowl Comprehensive Plan (Anchorage 2020)*. *Anchorage 2020* identified goals for industrial development and retention and called for protecting "Industrial Reserves" that are strategically located in relation to the Port, Railroad, and International Airport. It considered the potential for an expansion of air-freight distribution users into a global logistics industry in and around the Airport. It articulated the community desire to maintain a strong and diversified industrial economic base, and resolve conflicts between adjacent industrial and residential land uses.

Map 2. Anchorage 2020 Land Use Policy Map[4]



In 2006 the Municipality also updated its Comprehensive Plan for Chugiak-Eagle River. The *Chugiak–Eagle River Comprehensive Plan Update* calls for ensuring an adequate supply of land in suitable locations for commercial and industrial development that is compatible with community needs and resources. The Chugiak-Eagle River Plan calls for industrial land in these locations to be protected from non-industrial uses. It stated the need for industrial lands to have access to adequate utilities and services, access to major transportation systems, and buffering from adjoining incompatible uses.

In 2013 the Municipality adopted new land use regulations that would place some limits on incompatible uses in the Light Industrial District (I-1), and reserving the Heavy Industrial District (I-2) more exclusively for industrial uses. Restrictions on non-industrial use of industrial lands are intended to result in a more predictable and sustained supply of industrial land. It would be expected to result in a lower speculative value of many industrial lands and contribute to a lower overall development cost among industrial users than would occur otherwise. It would help retain an industrial land base for the long run, over successive economic cycles, particularly during peak periods in the commercial market.

[4] Map 2 is an excerpt from *Anchorage 2020 – Anchorage Bowl Comprehensive Plan*, page 50.

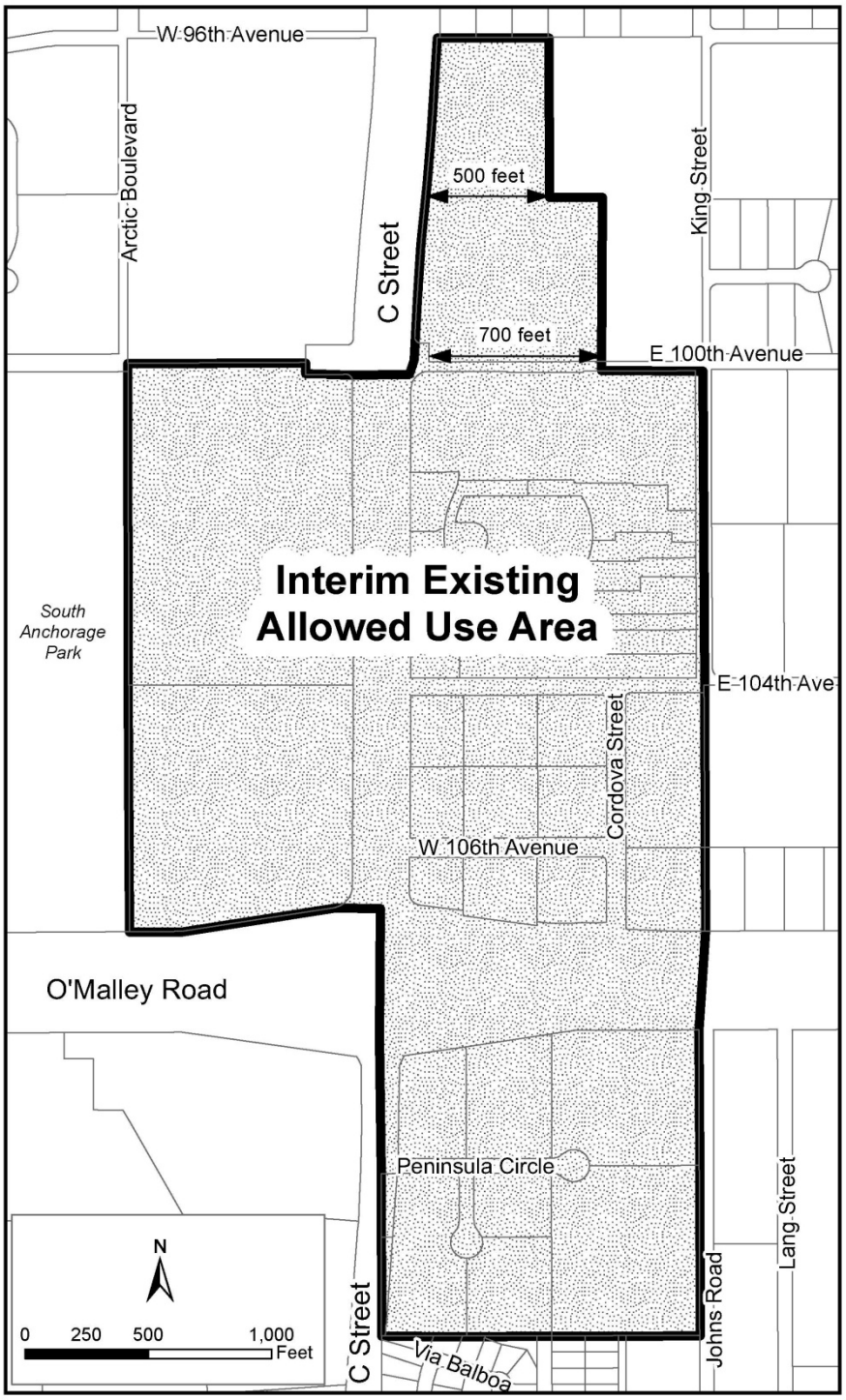
However, the Municipality has taken a "soft" approach to implementing the new regulations. Development applicants are given the choice to apply under the old (previous) Title 21 land use code until January 1, 2016. In addition, an interim provision in the new code allows developments in the I-2 district to include the same range of non-industrial land uses allowed in the more permissive I-1 district. Furthermore, in the new code, I-2 zoned lands along the south C Street corridor remain subject to old land use regulations as an interim measure until a land use plan map for the area can be adopted. This area along C Street, designated as an "interim existing allowed use area," includes some of the last remaining large undeveloped tracts of industrially zoned lands in the Bowl and falls within one of the *Anchorage 2020* "Industrial Reserves." However, this area has also experienced commercial big box retail development. The "soft" implementation approach in the new I-2 zone is intended to remain in effect until adoption of area-specific or citywide land use plans.

Anchorage 2020 recognized that scattered industrial areas outside of strategically located "Industrial Reserves" may be redeveloped to other uses. It states that some industrially zoned areas located within or adjacent to commercial centers could be encouraged to redevelop to commercial or residential uses in accordance with area-specific planning. A land use planning process is intended to determine which areas currently zoned industrial may be re-classified to commercial or other use.

Therefore, until such land use planning occurs, the Municipality is holding off from fully implementing the new Title 21 land use restrictions on incompatible uses within the industrial zoning districts. Some existing industrially zoned areas should be re-classified and encouraged to rezone to commercial use, in order for these areas to continue to develop in a commercial manner under the new Title 21 regulations.

A revised and updated *Anchorage Bowl Land Use Plan* (LUP) map element of the Comprehensive Plan is anticipated to come forward through a public planning process beginning in 2015. A previous draft LUP underwent public comment and review by the municipal Planning and Zoning Commission in 2006, during the rewrite of Title 21. The newly revised LUP will use updated information on current trends to address the challenges of providing the "right" balance of appropriately located residential, commercial, and industrial development to meet the city's needs.

Map 3. Interim Existing Allowed Use Area in the I-2 District[5]



[5] Map 3 is an excerpt from Anchorage Municipal Code (AMC) Title 21, Section 21.04.050C., *I-2 District*.

The Industrial Land Assessment update, including Volume I and this Volume II inventory of industrial lands, is intended to help answer land use planning decisions such as:

- Is the industrial zoned land base adequate to sustain forecasted long-term economic growth, and if not then to what extent is it not adequate?
- To what extent should the existing industrial land base in the Bowl and elsewhere in the Municipality be retained, reduced, or expanded?
- What types of areas are most strategic for industrial retention, and what areas should encourage development or redevelopment to residential or commercial use?
- What restrictions, if any, should be placed on various individual non-industrial uses within the remaining industrial I-1 and I-2 zoning districts? What allowances should there be for compatible or supportive non-industrial uses?
- What incentives, exceptions, programs, or other assistance should the Municipality consider to support industrial uses?

Land use planning decisions regarding the industrial lands will occur in context of competing needs, goals, and priorities. Recent land assessments completed in 2012 have documented areawide and local deficits in the needed land supply for residential and commercial uses. This report is one more piece of information to help inform that discussion.

Definition of Industrial Activities

Land use planning for industrial development requires an understanding of what is "industrial" and the predominant types and characteristics of contemporary industrial activity in the community. The remainder of section 2 defines and characterizes modern industrial uses, in relation to prevailing local industrial activities.

One way of conceptualizing contemporary industry is to augment the general term "industrial" with the more descriptive phrase "**production, distribution, and repair**" (PDR). PDR describes the activities of making, maintaining and moving goods and equipment. This shift in language by some cities, as documented by the economic development planning field in a recent report published by the American Planning Association (APA)[6], reflects the differences between modern industry from its historical, smokestack-laden predecessors. Its emphasis on "lighter" (e.g., less dirty, noisy, or bulky) forms of industry seems applicable to Anchorage's predominant forms of activity. According to the APA, the phrase PDR also delineates a finer-grained approach to planning that recognizes that industry is more than just manufacturing. It is also goods handling and transportation, repair and other services. In fact, distribution and other activities characterize Anchorage's industrial economy to a greater degree relative to manufacturing, than in some other cities. Lastly, according to the APA, PDR suggests possibilities for more contextual and integrative land use planning among various activities.

Production is the broadest of the three industrial use categories. In many cities, it is mainly manufacturing (of both durable and nondurable goods). However, it also includes power generation and construction contracting enterprises, which are prevalent in Anchorage.

Nationally, the trend in urban manufacturing in general has evolved toward small and medium-sized enterprises (SMEs), which are recognized for their disproportionate contribution to jobs and innovation, and economic growth. Both advanced manufacturing and more traditional manufactures are adopting new production techniques that are often less impactful on adjoining land uses. Nationally, urban SME manufacturers value proximity to customers, suppliers, and contractors supporting shorter production runs on smaller numbers of specialized goods. While manufacturing is not dominant among the industrial activities in Anchorage, this inventory has found it to be more prevalent than municipal planners anticipated. Along with other uses such as construction contracting and power generation, it makes "Production" the most extensive of the three PDR categories of industrial land uses in the Municipality (other than the major public transportation facilities including the Airport, Port and Railroad).

[6] Planners Advisory Service Report 577: Sustainable Industrial Development (American Planning Association, 2014).

"Production" Examples in Anchorage: Unique Machine

"Production" Examples in Anchorage: Yummy Chummies

Distribution is the second PDR sector. Distribution industries include wholesale activities, ground freight trucking, small-scale delivery services, taxi, towing, and other transportation services, and warehousing. Distribution also includes the major regional transportation facility hubs including the Port, Airports, and Alaska Railroad which comprise the dominant industrial-type use in Anchorage.

In many cities distribution activities serve as support to the local producers. However, in Anchorage's industrial economy, distribution takes on an outsized presence. This reflects the city's function as a transportation hub and center of support services for production activity (e.g., natural resource extraction) that takes place mostly elsewhere in Alaska or the world. While warehousing alone is not one of the dominant industrial uses in Anchorage due to characteristics of the local supply chain, wholesalers and ground transportation and freight services make the local distribution firms one of the largest industrial land users in the Municipality. Distribution firms also support other sectors of the local

economy. Other firms need paper, auto repair shops need a supply of parts, and metal fabricators need materials and supplies, etc.

"Distribution": Trucking freight company in South Anchorage

Repair comprises the third PDR sector. Repair activities are integral to the industrial economy and share land use characteristics and needs with the production and distribution enterprises. They often require industrial spaces with open storage yards. Repair uses work closely with both production and distribution establishments, sometimes locating nearby. Repair uses may combine production, installation, distribution, and repair. Typical goods subject to repair services include vehicles, equipment, and furniture. For the purposes of this study, building and property maintenance firms are also included in the repair category. Vehicle salvage, solid waste management, and snow disposal are also included. Repair uses also benefit from proximity to local retail markets. These services support the needs of non-industrial businesses and residents.

Truck repair co-located next to freight companies in Central Anchorage

Table 1 lists the common industrial economic sectors in Anchorage, using North American Industrial Classification System (NAICS) categories, arranged according to the conceptualization of PDR. A complete inventory of current industrial use by sector, and quantified in terms of amount of acreage used in the study area, appears in Section 4.

Table 1. PDR Industrial Classifications Common to Anchorage

	Industry Type	NAICS Code
Production	Metal fabrication	332
	Nonmetalic mieeneral products	327, 212
	Woodwork, furniture, paper and printing	321, 322, 323, 337
	Food and beverage products	311, 312
	Plastics, rubber, and foam products	326
	Sign fabrication	339
	Heavy construction contractors	237
	Special trade contractors	238
	Machinery related contractors	237, 238
	Electric power utilities	221
Distribution	Truck and freight transportation services	484, 487, 488
	Towing and other ground transportation services	485, 488, 492
	Wholesale – durable goods	423
	Wholesale – nondurable goods	424
	Warehousing	493
	Postal services	491
	Airport operations	481, 488
	Rail transportation	482, 488
	Marine port and harbor operations	483, 488
	Waste management	562
	Snow disposal	562
Repair	Vehicle salvage	562
	General automotive repair	811
	Automobile services and minor repair	811
	Heavy truck and trailer repair	811
	Equipment and machinery repair	811

The production, distribution, and repair categories represent a broad range of business types. Their space and infrastructure needs can therefore vary. However, most industrial uses in general share a common set of characteristics and needs. For example, industrial uses need much more space, to account for the materials and goods that are undergoing storage, distribution, repair, and fabrication. While these needs vary in degree depending on the use, they are indicated by the economic development planning field as common concerns in the industrial business community, as follows on the next page.

Characteristic Needs of PDR Uses:[7]

- Accessibility to customers, suppliers, workers, and road networks. Adjoining port, airport, and rail facilities are also of primary importance for some (but not all) types and scales of industry.

- Affordable, low rents per square foot, where land values, development costs, regulations, and other factors help avoid displacement by higher-rent uses.

- Clustering of similar industries and supplier and service networks. Repair firms, for example, need to be located near the equipment, vehicle, and furniture markets that they serve. These include both business-to-business (B2B) relationships and retail customers.

- Separation or buffering from residential neighborhood housing and other incompatible uses, and avoidance of traffic impacts to and from other uses.

- Buildings, facilities, and operating conditions that differ from retail, office, or mixed-use—such as a more flexible building space, larger rooms, wider floor plates, low-rise or single-story buildings, higher ceilings, and service bays—where vehicles can easily load, unload, or enter.

- Site characteristics including adequate parcel size with space for freight vehicle and equipment maneuvering and parking, and storage; and/or for outdoor storage and material handling.

- Also, while not reported in the general literature source cited for this list, local consultations affirm the need for access to power, heat, and communications utilities. For some industries, and more intensive industrial uses in general, access to urban water and wastewater services is also important.

Some emerging industrial-type uses may have different criteria for choosing buildings and sites than those listed above. Some urban production may blur the lines between office and production space, and prefer a location near downtown or commercial centers more than single-story low-rise industrial environments, because the urban location is appealing due to its proximity to customers or amenities. Space requirements may also be reduced by adoption of modern production technologies.

Several non-industrial retail, customer service, professional and technical service, and real estate service activities in Anchorage share some physical characteristics with industrial uses, although they are not industrial PDR

[7] Source: Planners Advisory Service Report 577: Sustainable Industrial Development (American Planning Association, 2014).

functions. These include, for example, retail sales of automobile and heavy goods, mini-storage facilities and outdoor storage space rentals. Some of these uses are space intensive, and occupy a significant share of the industrial land base; however, they do not function as industrial production, distribution, or repair activities.

Professional services uses, sometimes located in office-warehouse facilities, provide technical engineering or environmental services to industrial related enterprises.

Section 3 Methodology

Section 3 explains the methodology of the industrial land use inventory and estimate of buildable industrial land supply. It describes the analytical process that led to the findings in Sections 4 and 5 of Volume II.

This methodology is designed to provide a general order-of-magnitude estimate of (a) land area taken up by industrial activity; and, (b) buildable land supply, at a community wide and city subarea scale. A more site specific or parcel-by-parcel analysis would require a different analytical method. This inventory is not intended for the individual site scale, but rather supports areawide city land use planning and policy decisions.

Categorizing the Basic Land Supply in the Municipality

The entire land supply of the Municipality includes both vacant and developed lands, buildable and prohibitively constrained areas; uncommitted lands and lands committed to specific uses in all use categories of industrial, commercial, residential, public, institutional, and open space. It comprises some 1,955 square miles in total.

The Industrial Land Assessment study area, as established in Section 1 above, is only a part of this municipal land supply. The industrial study area comprises those areas of the Municipality which are relevant to existing and potential future industrial (PDR) activities. From the perspective of the Industrial Land Assessment, the municipal land supply consists of three kinds of lands:

Industrial Lands – These are lands currently zoned, designated, or utilized for industrial activities. This includes parcels zoned I-1, I-2, I-3, and MI; parcels zoned PC, PLI, or T which are currently in a PDR use; and parcels designated by the Municipality of Anchorage comprehensive plan for future industrial use.

Industrial Study Lands – These lands are other parts of the municipal land supply that, although not zoned or designated for industrial use currently, may potentially be available for industrial use within the 20-year planning horizon, or are subject to speculation by some observers that they could become available under certain scenarios. Examples include major landholdings on Fire Island, JBER, and in the Eklutna vicinity. Industrial study lands also include parcels in B-3 or other districts that adjoin existing industrial use areas and which are geographically interconnected with the industrial activities or which have disproportionate presence of PDR uses. For example, these include B-3 zoned segments of the Old Seward Highway commercial-industrial corridor between Tudor Road and DeArmoun Road.

Non-industrial Lands – The rest of the Municipality was not included in the Industrial Land Assessment Study Area. These "non-industrial" areas were already known or assumed from the outset to be committed primarily to other uses. Because of time and resource limitations, scattered industrial enterprises that exist outside the study area were not inventoried for this study. An example

of a production use outside of the study area is the Franz bakery which is grandfathered (i.e., a legally nonconforming use that was established before the current zoning regulations applicable to the area) on the southwest corner of Spenard Road and Hillcrest Drive in Midtown Anchorage. Distribution and repair uses such as auto repair and service also occur in B-3 zoned areas located outside the study area. Therefore, the inventory of existing industrial uses to some degree understates the presence of industrial uses currently operating in Anchorage.

The Industrial Land Assessment inventory, at a basic level, classified all parcels in its study area as either developed or undeveloped. It documented those parcels in which there was no observable activity or establishment, and the degree to which such sites were in a natural state, cleared or prepared for development, or had empty (vacant) structures on the lot. Lots in the development pipeline or showing signs of active construction were also documented, and attempts were made to classify the pending use. For those lots that are in use, it documented cases in which the lot was partially vacant or only marginally in use. Partially vacant and marginally used parcels are discussed in more detail below.

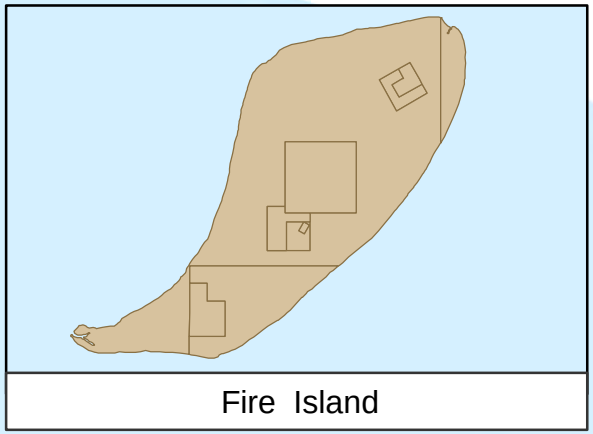
Identifying Industrial Study Subareas

Industrial lands and industrial study lands that comprise the study area include a variety of environments ranging from south C Street to Fire Island to the large northern landholdings of Eklutna, Inc. The Industrial Land Assessment breaks its analysis and findings into 11 subareas:

Anchorage Bowl	Chugiak–Eagle River	Other
North Anchorage	Eagle River	Fire Island
Central Anchorage	Powder Reserve	JBER
International Airport	Chugiak and 770 Tract	
South Anchorage	Birchwood Airport vicinity	
	Eklutna vicinity[8]	

Some subareas include clusters of industrial activity, such as the major industrial areas of the north, central, and southcentral Bowl, as well as smaller clusters in Eagle River and Chugiak. Other subareas are primarily study areas distinguished by geographical location or ownership, such as Anchorage International Airport or Fire Island. Maps 4 and 5 depict the subareas of the Industrial Land Assessment.

[8] "Eklutna vicinity" includes the landholding of Eklutna, Inc. west-northwest of Mirror Lake; the Eklutna Village vicinity north of the Glenn Highway, and the Eklutna Power Generation Plant industrially zoned area.



Joint Base
Elmendorf-Richardson

Glenn Highway
DeBarr Road
Muldoon Road
Boniface Parkway
Northern Lights Blvd
C Street
Tudor Road
Lake Otis Pkwy
Dowling Road
Raspberry Road
Minnesota Drive
Seward Hwy
Dimond Blvd
Abbott Road
Huffman Road

Municipality of Anchorage
Anchorage Industrial Lands Assessment

Anchorage Bowl Subareas and Fire Island

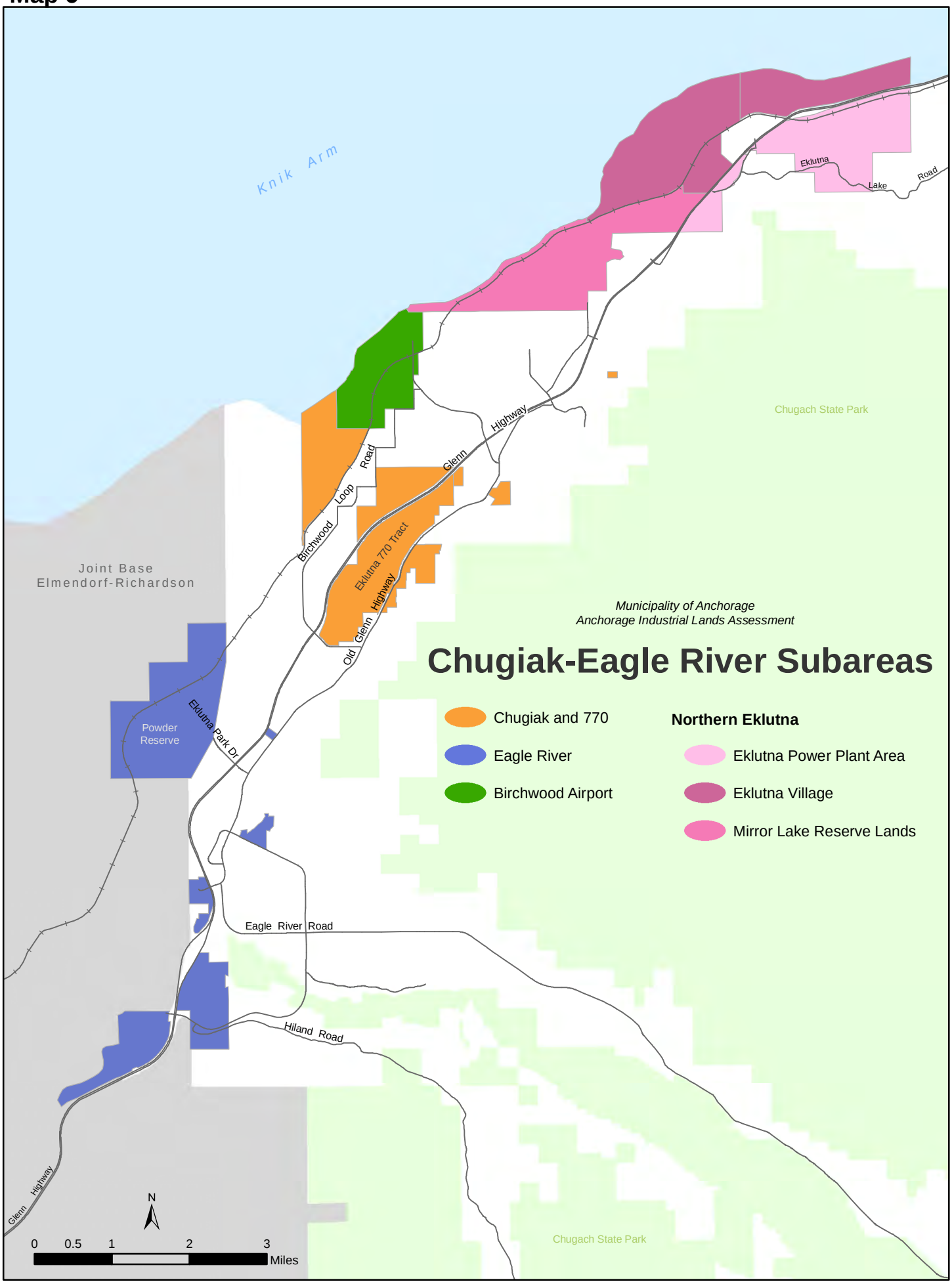
- North Anchorage
- Central Anchorage
- South Anchorage
- Anchorage International Airport
- Fire Island

N

0 0.5 1 2 3 Miles

Map 4

Map 5


Knik Arm
Eklutna Lake Road
Chugach State Park
Glenn Highway
Birchwood Loop Road
Eklutna 770 Tract
Old Glenn Highway
Joint Base Elmendorf-Richardson
Powder Reserve
Eklutna Park Dr
Eagle River Road
Hiland Road
Glenn Highway
Chugach State Park
N
0 0.5 1 2 3
Miles
Municipality of Anchorage
Anchorage Industrial Lands Assessment
Chugiak-Eagle River Subareas
Chugiak and 770
Eagle River
Birchwood Airport
Northern Eklutna
Eklutna Power Plant Area
Eklutna Village
Mirror Lake Reserve Lands

Classifying Uses

For the developed, partially developed, and even marginally used lands, the land inventory classified the activities observable on the land, economic functions, built structures, and site character of the lot, using the full range of industrial, commercial, residential, public, institutional, and open space categories. This allowed the inventory to determine the nature of industrial and non-industrial development. By aggregating parcel level data, the inventory estimated the amount of development for each type of industrial use type for each zoning district and industrial subarea of the community. Information about current industrial use patterns was used by the *Industrial Land Assessment: Volume I* to inform projections of future industrial growth within the Anchorage Bowl and Chugiak-Eagle River.

An inventory of existing industrial land use on each lot was previously conducted on a citywide basis in the early 1990s. To update its inventory, and to improve its understanding of the kinds of industrial uses that presently exist in Anchorage, the municipal Planning Division adapted the **Land Based Classification System (LBCS),** a multi-dimensional system developed by the American Planning Association (APA) in a partnership with geographic information system software maker ESRI, Inc. to classify land uses based on their characteristics. Among this system's strengths is the ability to cross-reference the land use categories with the North American Industrial Classification System (NAICS) codes. NAICS is the standard method of classifying economic enterprises in the economic development field, and is used by the Anchorage Industrial Land Assessment and similar studies in forecasting future land demand by sector.

The LBCS model classifies land uses on each parcel of land into multiple dimensions. These include the activities, economic function, buildings, and site development characteristics. The LBCS model can be adapted to a variety of planning applications, data collection, data-sharing and data-integrating methods, and color coding and mapping, to accommodate new methods and technologies for analysis, and to customize the model for local needs without losing the ability to share data. The flexibility of LBCS allowed municipal planners to tailor the system, by adding land uses distinct to the region (e.g., snow storage facilities), new land uses (e.g., DIY maker spaces), and simplifying the LBCS database structure to one database table more easily accessible to planners and other potential users.

The multiple dimensions of land use information from the LBCS system that became part of the Anchorage inventory of industrial lands include:

- **Activity:** Actual use of the land based on observable characteristics.
- **Function:** Economic function or type of establishment using the land, which can be cross-referenced to **NAICS** codes.
- **Structure:** The type of structure or building on the land.
- **Site:** Physical development character of the site.

Each dimension has its own categories and subcategories for classifying land uses. By classifying the use of each parcel across four dimensions, users have a more informative system for understanding the nature of industrial land use patterns. Because it cross-references with NAICS, it can be compared with the industrial land demand forecast by economic sector.

Where multiple activities, economic functions, or structures exist on a lot, the inventory team recorded each. Where multiple activities appear in more than one of these dimensions, it documented the activities, functions, and buildings as they related to each other.

The primary source for the industrial land use inventory update was a comprehensive field survey/inventory. Municipal planners conducted a windshield survey stopping at almost every property and establishment in the study area. Where necessary the field team entered the establishment and spoke with the business owner, manager, or employees who were present on site. This level of effort provided a more up-to-date and accurate data gathering process and a more robust level of understanding of the existing industrial uses and services.

Supporting sources of information for the update included municipal (MOA) Property Appraisal data, Google Street View, existing reports and online research, municipal aerial imagery, and municipal address, building permit, and business license files. Consultations and interviews with industrial development organizations including the Alaska Railroad, Ted Stevens Anchorage International Airport, Merrill Field Airport, the MOA Heritage Land Bank, MOA land use review agencies, Eklutna, Inc., CIRI, Chugach Electric Association, ML&P, and industrial operators and others who provided important and timely information.

The inventory field work began in August 2013, progressed northward from south Anchorage, and was completed with quality checking in April 2014. Field data from the four dimensions including Economic Function, Activity, Structure, and Site was entered into a geographic information systems (GIS) database for a total of 5,000 acres of I-1 and I-2 lands, and more than 18,000 acres of additional lands in other zoning districts within the land assessment study area (the field inventory did not include JBER or the majority of the International Airport). Most activities in the Alaska Railroad Ship Creek Terminal Reserve lands occur on Railroad lease lots, which are not platted and not in the municipal parcel database. The Alaska Railroad provided information regarding its existing lease lots and the businesses. The project team incorporated this information into a new parcel map tailored for this project, and conducted field surveys.

Data loading, processing, mapping, analysis, and summary reporting of this data was completed over a 10-month period until February 2015. Existing economic functions were grouped into major NAICS categories. The total amount of acres of land in use per NAICS sector was tabulated by zoning district and subarea.

To determine the total amount of acreage currently in use by economic function, the analysis needed to make certain assumptions about cases in which multiple different functions existed on the same lot. A certain quantity of acreage on the lot is taken up by each kind of use. This analysis needed to either analyze each lot individually or make assumptions about how it should allocate the lot's acreage among multiple economic functions. It being impractical to revisit or research each lot individually to estimate how much of the acreage should be allocated to each use, the planning and GIS team used random sampling to determine the average acreage typically used by each economic function, depending on the number of functions on the lot. These averages became the rule of thumb for the GIS to allocate acreage of lots with multiple uses[9], with the exception of very large tracts which were allocated among multiple uses individually.

Meanwhile, the analysis also had to account for single establishments that occupied sites consisting of multiple parcels in which one business on a site comprised multiple lots. In many instances, a business occupied a set of adjoining parcels that effectively functioned as a single lot. To enable a more accurate inventory and portrayal of characteristics such as the combined Floor Area Ratio (FAR) or Building-to-Lot-Value Ratio (BLVR) of the site, or a count of the number of sites on which individual use categories exist, the inventory team identified which sets of lots were a combined economic/land unit. These multi-parcel functional units are captured in the new land use database.

The acreages by economic sector were aggregated for the entire study area, and then were submitted to the consultant team for comparison with the net industrial land demand forecast by NAICS economic sector (see Volume I). Volume I uses the existing pattern of usage by the industrial economy as information to provide a baseline from which to make projections of land demand by economic sector, based on a plausible range of growth scenarios. While past and current need does not predict the future need, it does help to ground scenario-based projections. The inventory findings and tabulation of the acreage in use by NAICS economic sector within the study area are provided in Section 4.

[9] On lots with 2 economic functions only, 65 percent of the lot's acreage was allocated to the primary function, and 35 percent to the other function, except in cases of the presence of a single-family residence (which received half the acreage) or mixed-use apartments (which got 10 percent of the acreage). Where 3 economic functions existed on a lot, 50 percent of the lot's acreage was allocated to the primary function, and the remaining acreage was divided evenly among the other two functions. Where between 4 and 9 economic functions existed on a lot, 25 percent of the lot's acreage was allocated to the primary function, and the remaining acreage was divided evenly among all the other functions. A lot's acreage was divided evenly among 10 or more economic functions.

Estimating the Buildable Land Supply

The following is a conceptual framework for understanding the buildable land inventory method. The industrial land inventory process generally followed this framework and included four basic steps:

1. Classify land into mutually exclusive categories. As the first part of this section summarized, parcels were classified as vacant, partially vacant, or developed. Some parcels are used only marginally, such as with a temporary use, and so were included with the vacant lands as undeveloped lands. Meanwhile, parcels with permanent uses and structures may be considered redevelopable, for reasons such as low building value, yet remain subsets of developed land. The amount of vacant, partially vacant, and marginal use land is then tabulated as the "gross" acres of land supply.

2. Remove land with prohibitive constraints. Not all vacant land within the study area is developable. Critical environmental constraints, a lack of planned road access, or a specific commitment to a non-industrial use can make industrial development of an area unlikely within the planning horizon. These lands are deducted from the inventory. This deduction yields the "net" acres of land supply for future industrial development. The basic equation is:

   Gross Acres – Prohibitively Constrained Acres = Net Acres

3. Estimate the holding capacity of the remaining lands. The holding capacity of the land is its ability to accommodate employment growth, at prevailing densities of employment (per unit of floor area) and building floor area (per unit of lot area). Lands with favorable development conditions have full holding capacity to accommodate development at prevailing development densities. Favorable conditions include adequate parcel size, flat uplands with good soils, access to utilities, and locations with little market pressure to convert to non-industrial uses. Other areas, however, have constraints which compromise their full holding capacity, either partially or significantly. This analysis reflected reduced holding capacity by a percent reduction of the buildable acreage on the lot available for employment and FAR.

4. Explore redevelopment potential. Some developed land may redevelop to a higher intensity during the 20-year planning period. Exploring redevelopment potential means examining both the supply of redevelopment opportunities (determining which lands are the most likely to redevelop) and the likely demand for redevelopment (projecting the rate of redevelopment as a percentage of forecasted growth over the full planning horizon). This analysis used two basic factors to identify specific lands that may be relatively more likely to redevelop. It also suggests the rate of redevelopment in other cities as a first step toward attempting to determine what may be the likely rate of redevelopment to industrial uses in the future. A next step in such an analysis would be to determine Anchorage's historic rate of redevelopment to industrial uses. Then it could project that rate of redevelopment forward, and match that to the redevelopment supply.

Conceptual framework for buildable land inventory and capacity analysis

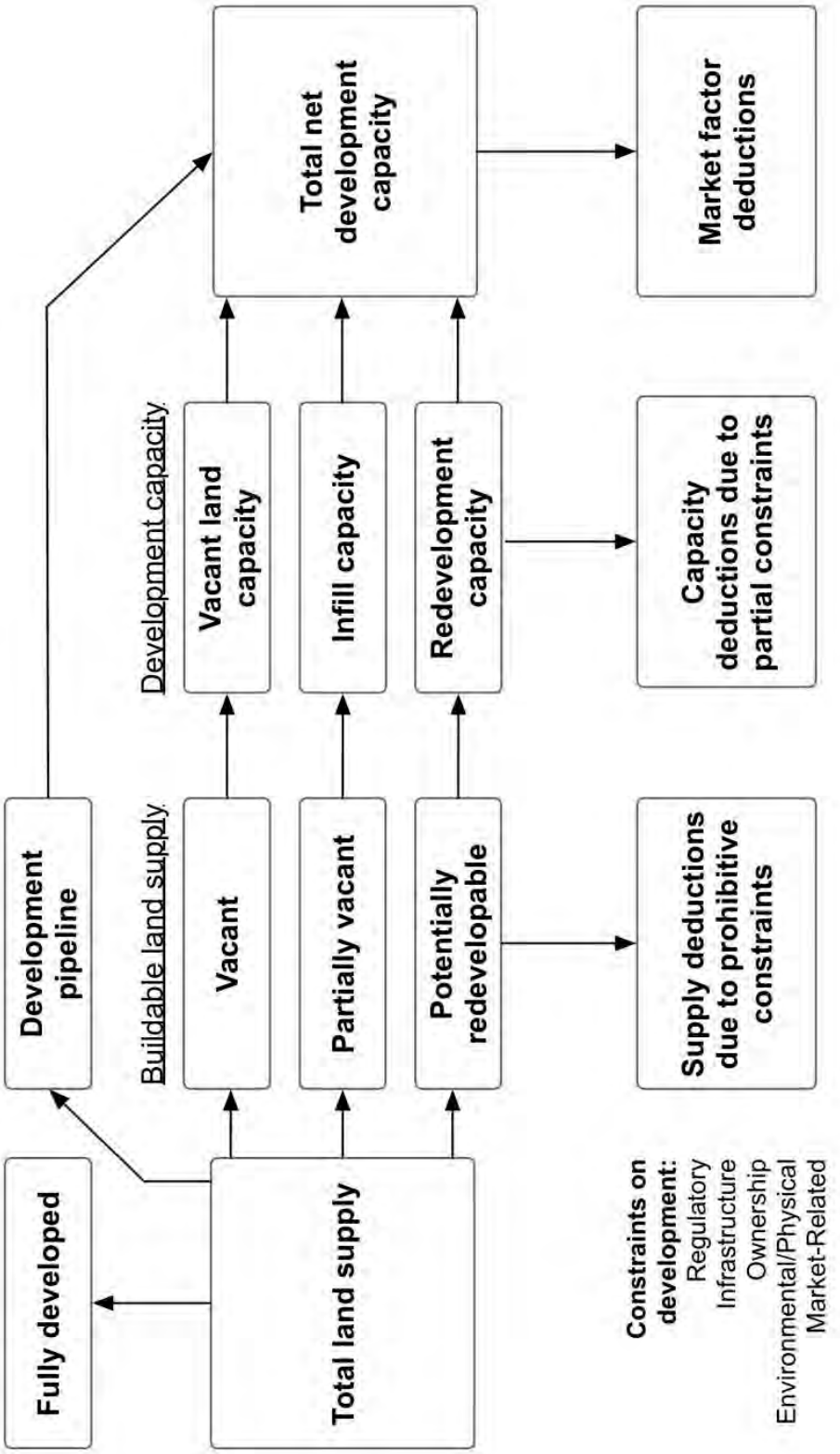


Fig. 7-4 Land supply and capacity analysis process. *Source: Moudon and Huber 2000. This material is used by permission of John Wiley & Sons, Inc.*

Identifying Vacant, Partially Vacant, and Marginally Used Lands

The first step in preparation of the buildable lands inventory was to assemble a gross supply of all undeveloped lands in the study area. These are comprised of vacant, partially vacant, and marginally used parcels. This becomes the "gross" acreage of undeveloped land, before deducting prohibitively constrained lands and lands already committed to a non-industrial use.

Vacant Land is defined as a parcel that has little or no improvements or structures, and is not encumbered by an existing primary or accessory use such as parking or equipment storage for another parcel. The parcel either has no previous use or the previous use was cleared years before.

Vacant lot in I-1 District

Partially Vacant Land is defined as a parcel occupied by a use on part of its area but which contains enough unused or vacant land to be further subdivided or developed with infill. No reuse or demolishing of pre-existing structures is necessary to develop the vacant portion of the land.

Partially vacant lot near Cinnabar Loop area

Marginally Used Land is defined as a parcel with a very low level of development or improvement and is occupied solely by temporary or marginal activities located outside or in moveable structures. The lot may be cleared and unpaved, or paved. It is marginally occupied by uses such as a used car lot, coffee kiosk, mobile food vendor, outdoor topsoil renderer, or potted tree sales. In addition, certain uses that may be seen as more stable in other districts but temporary in an industrial zone were included, such as single-family, duplex, and mobile homes. Lots with only empty, vacant buildings (e.g., an entire building and lot for lease) were also included in this category. Outdoor storage areas observed in the field as not being recently used for the most part were considered marginally used as well. However, outdoor storage or parking lot areas that were fully utilized or integral to a business enterprise are not included.

Marginally used lot with a coffee cart and used car lot on East Dowling Road

The vacant, partially vacant, and marginally used lands comprise the undeveloped land supply with no existing activities or functions, or only marginal or temporary existing uses. The redevelopment potential of developed parcels fully used by active enterprises was explored separately, and is discussed in a later section.

Planners established the eight month land use inventory period from August 2013 through April 2014 as the baseline point in time from which to measure the buildable land supply. For the purposes of estimating the land supply, all structures existing as of the inventory were considered developed, while projects that were proposed or built after the field inventory occurred are counted as future capacity.

Tables 2, 3, 4, and 5 detail the screening criteria used to define and identify the vacant, partially vacant, and marginally used lands. The four-digit numeric codes presented in the right-hand columns refer to the LBCS land classifications of the land use inventory.

Table 2. Vacant Lands Screening Criteria

Screening Criteria	Specific Query in the Land Use Database
No existing use activities or establishments; and	• Activity code is 9000 or 3300 only; and Function code is 9910 only (i.e., no existing use); AND
No existing buildings or vertical structures. Any previous development cleared years ago. Some lots may have movable abandoned structures.	• Structure code is 9000 (no structure), 6910 (kiosk), 6920 (roadside stand), 6980 (temporary building), 5210 (parking), or 5211 (driveway access).

Table 3. Partially Vacant Lands Screening Criteria

Screening Criteria	Specific Query in the Land Use Database
A portion of the lot that is observed to be large enough to accommodate another primary use or principal building has no existing use activities or establishments.	• Activity codes include 9050, and/or Function codes include 9050.

Table 4. Marginally Used Land Screening Criteria

Screening Criteria	Specific Query in the Land Use Database
The lot is underutilized in any one or more of the following ways:	• Any one of the following selections:
The lot is primarily underutilized outdoor storage, snow storage, soil storage/rendering; OR	• Activity codes include 9080 and either 3125, 3126, and/or 4400; and/or Function codes include 9080; OR
Empty buildings or vertical structures exist on site. No activities or establishments. Development would be through re-use, addition, or redevelopment of structure; OR	• Activity code is 9000 only, Function code is 9910 only, and Structure code(s) include types of structures other than or in addition to the following: 9000, 6910, 6980, 5210, and 5211; OR
Only existing use is a food or beverage cart, used car sales, building materials sales, outdoor tree nursery, auctions, or other typically temporary use; and structure is temporary; OR	• The parcel is not associated with another parcel; and the only Function code is 2111, 2112, 2123, 2126, 2145, 2154, 2550, 5320, or 9142; and Structure code(s) are limited to one or more of: 6910, 6920, 6980, or 9000; OR
Only use is a low-density residential use, such as a single-family house, duplex, mobile home on a lot, or a mobile home park; OR	• Activity and Function codes are 1100 only; and Structure code is 1001, 1102, 1103, 1201, 1220, 1240, 1800, 1981, 5210, or 5211; OR
The parcel is a yard associated with a single-family residential use; OR	• Parcel is associated with another parcel; has an Activity and Function code of 1100; and a Structure code of 6980, 8000 or 9000; OR
Is in any other way determined to be underutilized, such as lots determined to be highly likely for use turnover within planning horizon.	• Select for any additional lots in which the Activity codes include 9080, and for lots with low intensity of improvements or establishments that are determined through research and interviews as likely to turnover within the planning time horizon

Forecasting an Industrial Redevelopment Rate

Potentially Redevelopable Land is a developed parcel that is currently fully utilized, but on which there exists the potential that existing development could be converted to a more intensive use within the 20-year planning horizon. This intensification could occur through expansion or demolition and replacement of the pre-existing structure(s).

At the general, city-scale level of analysis, some important factors that determine whether an area will redevelop within the planning time horizon are: market forces that create opportunities or pressures to redevelop, zoning regulations that permit a more intensive use and public or other investments or incentives that encourage redevelopment. For areawide land supply analyses such as this Industrial Land Assessment, a common approach by land use planners to estimate the "redevelopable supply" is to identify those developed lands that have a low building-to-lot floor area ratio (FAR) or building-to-lot-value ratio (BLVR). This information may be used in combination with factors such as existing uses which generate little income.

For example, an industrial zoned lot currently occupied by a small structure with a low assessed value of building improvements, would typically be identified in a citywide land assessment study as part of the potentially redevelopable land supply.

A small construction contractor structure on a large lot

However, many industrial lots have few improvements and a low FAR and BLVR, yet are fully utilized by the business for equipment parking, maneuvering, storage, and maintenance integral to the enterprise. As discussed near the end of Section 2, PDR businesses such as contractors with heavy equipment need ample outdoor space. Section 2 also notes that these enterprises must locate near their customers and suppliers. For reasons such as these, it is a question as to whether the same FAR and BLVR ratios that planners use to identify redevelopment potential on commercial or multifamily zoned lots will necessarily predict that an industrial lot will redevelop. An outdoor, unimproved yard area or lot with no building may be outdoor space that is needed and fully utilized by a local PDR firm.

Meanwhile, industrial lots that according to general FAR and BLVR criteria would not be considered potentially redevelopable might actually be expanded. This can occur when an existing business enterprise wishes to expand however it determines that it has nowhere else to go other than its current location. For example, the food manufacturing plant pictured below recently requested entitlement to expand its building area by approximately 5,000 square feet. Because the building floor area and footprint already covered most of the lot, the lot had difficulty meeting the minimum parking required to allow for an expansion.

Food manufacturing plant that requested expansion in Midtown

The building above is leased to non-industrial commercial uses. Most industrial uses generally have less opportunity to intensify or create more compact development through redevelopment of existing uses. While office or residential uses may replace parking lots and single-story buildings with multilevel structures and mixed-use, industrial uses tend to remain single-story and in need of a lot of space for the storage and movement of goods and equipment.

There has yet to be developed "right" guess-estimate of the total quantity of land in Anchorage that will be available or likely to redevelop to more intensive industrial use within the planning horizon. Depending on market conditions, cost and other factors, theoretically nearly all or almost none of Anchorage's industrial land base might redevelop within a given period.

An alternative approach used by other cities is to analyze the historical rate of commercial and industrial redevelopment, and forecast a future redevelopment rate. In the Anchorage Bowl, this would involve determining recent trends in the local redevelopment rate—i.e., calculating the percentage of development for commercial and industrial sectors that has occurred through redevelopment on already developed land, and compare these rates to other cities. For example,

one study found that 22 percent of industrial development[10] in the Portland metro region in recent history occurred on already developed land.

The municipal Planning Division conducted a similar analysis for the *Anchorage Housing Market Analysis* in 2012. It estimated the redevelopment rate of recent multifamily development, to help estimate how much redevelopment would need to occur in order to supplement the building potential of the vacant land supply and meet future housing needs. Like the housing analysis, a commercial-industrial analysis would limit its research to redevelopment projects where the net building floor area on a site increased substantially. An analysis of recent historical redevelopment rates might therefore be a useful follow-up to the 2012 *Commercial Land Assessment* and this Industrial Land Assessment.

Until the Municipality has such an analysis, this industrial land inventory used certain assumptions about FAR and BLVR to illustrate which lands and subareas may be relatively more likely than other lots to experience redevelopment if the future redevelopment rate in the Anchorage Bowl were to be approximately half of all future industrial development in the 2015–2035 planning horizon were to occur on land already developed.

Table 5. Redevelopable Lands Screening Criteria for this Analysis

Screening Criteria	Specific Query in the Land Use Data Base
Lot utilized for parking, outdoor storage, or other low-intensity improvements with very low ratio of building area to lot area, and low building-to-lot-value ratio.	• Floor area ratio (FAR) of less than 0.10, and building-to-lot-value ratio (BLVR) of less than 0.75.

As discussed in Section 5, the screening criteria yielded 208.2 acres of redevelopable land. This does not mean that Anchorage has 208 acres of redevelopable land supply—it only illustrates one scenario for which lands might redevelop under a particular growth rate and rate of redevelopment. However, the Industrial Land Assessment carries forward the methodology of the 2012 Commercial Lands Assessment and Housing Market Analysis, by not mixing developed lands into its final estimates of remaining buildable land supply reported in Section 5.

[10] This refill rate was measured by square footage. By comparison, 59 percent of commercial development, as measured by square footage, occurred on already developed land. (*Refill Report – Measuring Past Refill Rates and Forecasting Future Refill*, Portland Metro, 2011)

Determining Constraints to Industrial Development

The second step in the construction of the industrial land supply inventory was to identify prohibitively constrained lands and partially/significantly constrained lands. Constraints on development are related to a variety of factors including environmental, land use, and urban service constraints that limit both the supply of land and the development capacity of the land. Lands found to be prohibitively constrained were removed from the gross buildable land supply to yield a "net" buildable land supply.

Unlike the prohibitively constrained areas, lands with only partial or significant constraints were not deducted from the net acreage of land supply. Rather, a deduction factor was applied to these lands for the development capacity analysis, reducing their available acres to the "effective buildable acres."

Partially and significantly constrained lands include permit-developable wetlands, areas without public wastewater service, or other lands with mitigating constraints that do not completely preclude industrial development but nevertheless restrict economic feasibility or limit their development capacity to one degree or another. Based on the relative impacts of these factors as experienced and observed in the Municipality, the analysis identifies two levels of such constraints: "partially constrained" (less severe) and "significantly constrained" (more severe).

Constraints, whether prohibitive, significant, or partial, fall into three main categories: environmental, commitments to non-industrial use, and (lack of) urban services.

Environmental Constraints

Environmental constraints can limit the net supply of buildable land, as well as the capacity of remaining buildable lands. An environmental suitability analysis was conducted at an areawide scale to estimate the overall acreage of buildable land in the Bowl and Chugiak-Eagle River study area that is environmentally unconstrained, partially constrained, significantly constrained, or prohibitively constrained for future industrial development. The methodology was updated for the industrial study to improve upon suitability analyses used in previous municipal plans and land assessment studies.

Table 6 on the next page describes the definitions and criterion for environmentally unconstrained, partially constrained, significantly constrained, and prohibitively constrained land.

Table 6. Environmental Constraints Criteria

Level	Definition	Criteria
Unconstrained	Lands not constrained by environmental factors.	• All areas not affected by environmental constraints.
Partially Constrained	Lands with some environmental constraints that reduce the amount of development that the property can support.	• Class C permit review wetlands and Class P undesignated wetlands and a 15-foot buffer extending from the edge of the wetland. • 100-year floodplain (this does not affect secure and nonhazardous uses, but can be prohibitive for certain industrial activities). • Slopes between 15% and 25%. • High seismic hazard areas (this constraint does not affect certain industrial uses).
Significantly Constrained	Lands with more substantial environmental constraints that further reduce the amount of development that the property can support.	• Class B permit review wetlands and Class D undesignated wetlands, and a 15-foot buffer extending from the edge of the wetland. • Slopes between 25% and 45%. • Very high seismic hazard areas (while this may not affect low-intensity uses, it can be prohibitive for intensive industrial uses).
Prohibitively Constrained	Lands that are assumed to be undevelopable and are subtracted from the buildable land supply for industrial development.	• Class A wetlands and a 15-foot buffer extending from the edge of the A wetland. • Waterbodies such as lakes and ponds, including a 25-foot buffer around the edge of the waterbody. • Floodways. • Marine coastlands. • Slopes greater than 45%. • Stream buffers of 25 feet on both sides of the stream bank except: o increases to 100 feet around anadromous fish streams within wetland areas. o increases to 65 feet in non-anadromous fish streams within wetland areas. o increases to 50 feet in lots 15,000 square feet or larger in size due to potential future changes in stream setback regulations.

After identifying individual environmental constraints, a cumulative analysis was conducted using all of the environmental data layers and allowing the more restrictive constraints to prevail. For example, if a land area was designated as "Class C" wetlands, it would be considered partially constrained for development purposes. However, if that same area was also included in a very high seismic risk area (a significant constraint factor for industrial development), then the "significantly constrained" designation would apply to this land in the cumulative analysis.

In addition, some lands may be *manually* designated as either partially constrained or unlikely to develop within the planning horizon, based on personal interviews or local knowledge. For example, individually selected tracts are identified as unlikely to develop because of peat soil conditions that were not shown on municipal GIS soils data layers.

Partially and significantly constrained lands are still included in the buildable land supply inventory. Partial and significant constraints are factored into the amount of buildable land supply as a final step, to reflect the diminished holding capacity of these lands to support the potential amount of future industrial employment. For this analysis, the development capacity of partially constrained lands is reduced by a factor of 25 percent—i.e., the potential additional new floor area and employment that a given area of land would otherwise be expected to support is reduced by one-quarter. This is a change from previous studies, which assumed the development capacity would be reduced by a factor of 33 percent. This change reflects planning staff observations of recent trends and site examples, and reflects increasing land values and development pressures on Class C wetlands, moderate slopes, and other marginal lands.

The capacity analysis reduces the development capacity of significantly constrained lands—including B wetlands, steep slopes, and very high seismic hazard areas—by a factor of 50 percent. This is a greater deduction than assumed by previous land assessment studies. It reflects recent experience by permit review staff observing wetland cases, and recent changes to zoning regulations on steep slope sites. Commercial and industrial uses must show a strong purpose and need to develop the B wetlands and show how they will offset impacts. The amount (and cost) of mitigation for Class B wetlands is in fact closer to that of Class A wetlands than to Class C wetlands. MOA environmental planners also report that there is a change to U.S. Army Corps of Engineers' (USACE) requirements expected at the federal level that will make it more expensive to develop Class B wetlands. It is also anticipated to become harder to obtain permits as the resource becomes scarcer in Anchorage. Therefore, where previous analyses assumed a 33 percent reduction in capacity, this analysis creates a new category of constraint level, called "significantly constrained" and raises the impact to 50 percent.

These percentage reductions in holding capacity are averages applicable at a citywide or city sub-region level of geography, for use in long-range city planning forecasts. They are not designed to predict development capacity outcomes on specific individual parcels.

Table 7 summarizes how the three levels of environmental constraint—partial, significant, and prohibitive—affect the estimated buildable land supply and the analysis of the future development capacity of those buildable lands.

Table 7. How Environmental Constraints Impact the Land Supply Inventory

Level of Environmental Constraint	Impact on the Net Buildable Land Supply	Impact on the Development Capacity of the Land
Unconstrained land	The land's full acreage is included in the net buildable land supply.	No impact.
Partially constrained land	The land remains in the net buildable land supply, but its capacity is impacted (see right).	Inventory analysis reduces development capacity by a factor of 25 percent (a 25 percent reduction on the effective acreage used to compare with industrial land demand).
Significantly constrained land	The land remains in the net buildable land supply, but its capacity is impacted (see right).	Inventory analysis reduces development capacity by a factor of 50 percent (a 50 percent reduction on the effective acreage used to compare with industrial land demand).
Prohibitively constrained land	The land is deducted from the net acreage of buildable land supply.	The land is not included in the capacity analysis.

Land Use Commitments

The second type of constraint to industrial development is land use commitments to a specific future non-industrial use. Land use agreements, master plans, or other encumbrances designating a future non-industrial use are considered prohibitive constraints which eliminate parcels from the buildable land supply for future industrial development purposes. Land use commitments include:

- Conservation easements and other protections;
- Designated parks;
- Future public utility facility;
- Future road, railroad, or aviation use; and
- Future residential, commercial, or civic/institutional use.

Conservation easements and other protected lands also include other forms of protection such as plat notes and deed restrictions. It also includes municipal Heritage Land Bank parcels that are preserved in the future, such as part of a HLB wetland mitigation bank currently under development. Finally, it includes lands which are likely to remain as privately owned natural areas, such as Eklutna, Inc., lands northwest of the Alaska Railroad Corridor near the village of Eklutna.

Future parks and recreation lands include dedicated parkland and lands designated in the municipal Comprehensive Plan as future parkland.

As documented in Section 5 of this volume, certain public-owned lands are encumbered as future utility facility sites, roadways, or have been identified for future Alaska Railroad or airport operational areas. Aeronautical use areas within Anchorage International Airport and Merrill Field Airport are considered reserved for aviation uses. Consultations with Joint Base Elmendorf-Richardson (JBER) natural resources management staff and federal land managers helped determine that few parcels (if any) in JBER are not already encumbered for military operations such as to be available for non-military industrial use in the planning horizon.

Certain sites within the study area are committed to specific future residential, commercial, and/or civic/institutional uses. For example, as of this writing land use entitlements for an outlet retail mall, an athletic club, and other non-industrial uses are currently in process for development in existing vacant industrially zoned lands in the study area. Other lands within the study area boundaries are zoned for non-industrial use include parcels zoned B-3, RO, PC (in the Bowl), or residential. Parcels in these zoning districts are assumed by this study to be committed to future non-industrial use. In addition, tracts of land in the Chugiak-Eagle River area are committed to primarily non-industrial use, such as part of the Powder Reserve Tract B, and the proposed Eklutna Village Overlay District area.

In summary, areas with land use commitments are subtracted from the buildable land supply, except that future utility and airport use areas are credited toward anticipated land demand of their facility.

Table 8. Land Use Commitments and their Impact on the Industrial Lands Inventory

Type of Land Use Commitment	Impact on the Net Buildable Land Supply	Impact on the Development Capacity of the Land
Conservation easement and other protections	The land is subtracted from the net acreage of buildable land supply.	The land is not included in the capacity analysis.
Land is dedicated park or designated for park or open space use.	Same as above.	Same as above.
Site is committed to a residential, commercial, or institutional use.	Same as above.	Same as above.
Lands zoned for non-industrial use—e.g., B-3, RO, PC (in Bowl), or R.	Same as above.	Same as above.
Tracts of land in Chugiak-Eagle River designated for future non-industrial use, such as Powder Reserve and Eklutna Village Overlay areas.	Same as above.	Same as above.
Land encumbered as future utility facility sites, roads, or railroad or airport operations	The land is subtracted from the net acreage of buildable land supply except for Transportation and Utilities Sectors.	Holding capacity is not included in the estimated land capacity available for non-Utility/non-Transportation sector industrial uses

Urban Service Constraints

The continued absence or limitation of transportation and utility infrastructure through year 2035 would constrain or prohibit future industrial development potential of an area. Urban service constraints considered in this study include:

- **Road Access:** A lack of road access or unlikely outlook for road network development within the planning timeframe is considered a prohibitive constraint for most industrial uses.
- **Water:** A forecasted lack of public water service is considered a partial constraint to industrial development.
- **Wastewater:** Lack of public wastewater service is considered a significant constraint to industrial development.

Access to other services including electric power and telecommunications is essential to most industrial users; however, consultations with utility service providers indicated that most parts of the study area could have access to these services over the planning horizon. (A discussion regarding access to three-phase electrical power lines appears below.)

Future industrial PDR development in the Municipality is expected to continue to follow its historical pattern of dependence on direct access to ground freight and road transportation infrastructure. Likelihood of road access is critical before the Municipality could prudently assume that a given tract of land will be available as part of the industrial land supply.

Three parts of the study area were forecasted to remain without road access or a road network through the 20-year planning horizon. Discussion regarding Fire Island and two affected areas in the northern Eklutna vicinity is provided in the land supply findings of Section 5.

Based on information from personal interviews, interagency consultations, discussion with the advisory committee for this study, and an inventory of existing development, this analysis assumes that water service is a partial constraint on industrial development, therefore moderately reducing development capacity. These sources suggest that, for more intensive industrial uses such as manufacturing, wastewater service is more critical. Therefore, the lack of wastewater service is raised to the level of a significant constraint to development having a stronger impact on development capacity for a range of PDR uses.

Consultation with project Advisory Committee members and the Anchorage Water and Wastewater Utility (AWWU) provided the basis for forecasting the geographic extent of water and wastewater services within the study area through the planning horizon. In general, nearly all areas of the Bowl, except for certain pockets affected by multiple ownerships of land, are anticipated to have access to water and sewer. Sewer service limitations in the South C Street corridor, the eastern portion of the Railroad Terminal lands in Ship Creek, and

several other larger tracts are anticipated to be resolved within the first half of the planning horizon.

Areas needing infrastructure for development are typically charged for the improvements through a Local Improvement District (LID). Past studies have noted that development entities indicated reluctance on the part of some smaller landowners with low demand to enter into improvement districts and take on additional costs.

Geographic limits to the extent of water and sewer service in Chugiak-Eagle River resulted in much of its acreage in the study area being identified as constrained due to lack of water and wastewater services. Lack of sewer service in particular impacted the estimate of available land capacity in Birchwood Airport vicinity, Chugiak and 770 Tract, and Eklutna Power Generation Plant vicinity—reducing the effective acreage of buildable land by 50 percent, for purposes of matching land supply to forecasted demand.

The Industrial Land Assessment Advisory Committee discussed the 50 percent reduction factor over the course of several meetings. Committee discussion and feedback supported the 50 percent reduction as generally reasonable, as it was applied as an average across the study area. These percentage reductions in holding capacity are averages applicable at a citywide or city sub-region level of geography, for use in long-range city planning forecasts. They are not designed to predict development capacity outcomes on specific individual parcels. The Advisory Committee members expressed support for the approach and did not believe the study should get into a parcel-by-parcel constraints analysis.

The lower level of intensity of non-wastewater users was a key reason. Lands with on-site septic are not as desirable for certain manufacturing purposes, for example. Committee members pointed out that some industrial uses are non-intensive but could provide options for firms that need more space that may not need sewer and/or water services with a low employee count, such as storage. This seemed in line with potential users currently looking at lands in Birchwood Airport, which will have access to on-site septic. Committee members considered it possible to do things such as distribution without sewer service. The attraction of lower intensity use outside the wastewater service area boundaries is part of appropriately locating different kinds of industrial uses: moving some lower intensity uses out of the Bowl and making more space available in the Bowl for more intensive users.

Table 9. Impacts of Urban Service Constraints on Buildable Lands Inventory

Type of Urban Service Constraint	Impact on the Net Buildable Land Supply	Impact on the Development Capacity of the Land
Land not likely to receive water service	The land remains in the net buildable land supply, but its capacity is impacted (see right).	Inventory analysis reduces development capacity by a factor of 25 percent. The analysis uses a 25 percent reduction on the effective acreage used to compare with industrial land demand.
Land not likely to receive wastewater service	The land remains in the net buildable land supply, but its capacity is impacted (see right).	Inventory analysis reduces development capacity by a factor of 50 percent. The analysis uses a 50 percent reduction on the effective acreage used to compare with industrial land demand.
Land not likely to receive road access or a road network	The land is subtracted from the net acreage of buildable land supply.	The land is not included in the capacity analysis.

Other Potential Urban Service Constraints Discussed: Power Service

Discussions with the Industrial Land Assessment Project Advisory Committee about potential land constraints to industrial use included a question about electrical power service. Some parts of the study area would require extension of electrical utility service. Other lots are serviced by single-phase rather than 3-phase power, which may not be adequate for certain industrial users and therefore also necessitate an extension. Discussions arrived at the conclusion that there is no place in the study area where extending single or three-phase power would be prohibitive—it is only a matter of cost. Chugach Electric Association provided consultation on this issue.

Chugach Electric Association (CEA) indicated that it has not historically had a problem extending power to lands zoned Industrial in its service territory within the Municipality of Anchorage. In general, the distribution system is well developed within CEA's Anchorage territory. Under CEA's line extension tariff (approved by the Regulatory Commission of Alaska), developers are responsible for the cost of extending primary service to their property, as well as the cost of the service line(s) and related equipment to serve the electric load on their property. Line extensions may be either single-phase or 3-phase, depending

upon the needs of the customer. CEA pays for the needed transformer and applies a credit (based upon the anticipated electric load) toward the cost of the line extension. While on occasion a prospective developer has decided not to proceed with plans, in general the cost of extending electric service has not deterred the development of industrially zoned property in CEA's service territory.

Cumulative Analysis of Constraints

Maps 6 and 7 identify the constrained lands within the study area for the Anchorage Bowl and Chugiak-Eagle River, respectively. They visualize the cumulative layers of environmental, urban service, and land encumbrance constraints on various areas.

After identifying these affected areas, and determining the levels of environmental, land use commitment, and urban service constraints, a cumulative analysis was conducted using all of the constraints' layers. Where more than one constraint was present, the analysis allowed for the most restrictive constraints to prevail. For example, if a land parcel was covered by Class C wetlands, it would be considered partially constrained for development. However, if that same parcel was also determined to be unlikely to receive sewer service (a significant constraint factor for industrial development), then the "significantly constrained" designation would apply to the lot in the cumulative analysis. If the same parcel were also identified as being committed to a future non-industrial use, then the "prohibitively constrained" designation would apply to the lot in the cumulative analysis.

The tables below quantify the acreage of partially, significantly, and prohibitively constrained lands within the overall gross supply of undeveloped lands in the study area, as determined through the constraints analysis. Table 10 summarizes this acreage for the Anchorage Bowl, and Table 11 covers Chugiak-Eagle River. In addition, Fire Island's 4,240 acres and nearly all 73,104 acres of JBER were found to include prohibitive constraints to non-utility facility industrial development within the planning time horizon.

Tables 10 and 11, as the starting place for the land capacity analysis, included the acreage of *redevelopable* lands, a category of lands discussed on page 37, within the gross land supply. For example, approximately 300 acres out of the 635 acres of unconstrained industrially zoned lands in Table 10 are actually "redevelopable" lands. Chapter 5 separates redevelopable lands from the final estimate of net buildable land supply, and discusses them separately.

The industrial land supply is the net supply of buildable vacant, partially vacant, and marginally used land after deducting constrained lands. The net buildable land supply was used as the basis from which to estimate the future industrial development capacity.

Table 10. Acres of Constrained Land within the Gross Industrial Land Supply Anchorage Bowl, 2014

Level of Constraint	Industrial Districts	Other Districts	All Districts Total
Unconstrained			
Subtotal	635.1	213.6	848.7
Partially Constrained			
Subtotal	70.1	21.7	91.8
Significantly Constrained			
Only because of no wastewater service	56.2	67.0	123.2
All other significantly constrained lands	41.9	9.0	51.0
Subtotal	98.2	76.1	174.2
Prohibitively Constrained			
Only because of no future road network access	0	0	0
Committed to utility or transportation facility use	104.2	795.4	899.6
All other prohibitively constrained lands	169.0	681.6	850.6
Subtotal	273.2	1,477.0	1,750.2
Total	1,076.5	1,788.3	2,864.8

Table 11. Acres of Constrained Land within the Gross Industrial Land Supply Chugiak-Eagle River, 2014

Level of Constraint	Industrial Districts	Other Districts	All Districts Total
Unconstrained			
Subtotal	28.2	82.7	110.9
Partially Constrained			
Subtotal	11.3	344.2	355.4
Significantly Constrained			
Only because of no wastewater service	340.0	232.1	572.1
All other significantly constrained lands	2.1	7.0	9.0
Subtotal	342.1	239.1	581.2
Prohibitively Constrained			
Only because of no future road network access	0	1,671.7	1,671.7
Committed to utility or transportation facility use	34.4	406.6	441.1
All other prohibitively constrained lands	239.8	4,255.8	4,495.6
Subtotal	274.2	6,334.2	6,608.4
Total	655.8	7,000.1	7,655.9

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Municipality of Anchorage
Anchorage Industrial Lands Assessment

Constraints on Industrial Development in the Anchorage Bowl

Joint Base Elmendorf-Richardson

Post Road
Glenn Highway
3rd Avenue
5th Avenue
6th Avenue
I Street
E Street
15th Avenue
Bragaw Street
Boniface Parkway
Turpin Street
DeBarr Road
Muldoon Road
Point Woronzof Drive
Postmark Drive
Wisconsin Street
Minnesota Drive
A Street
Fireweed Lane
Lake Otis Parkway
36th Avenue
Arctic Boulevard
Tudor Road
International Airport Road
Dowling Road
Raspberry Road
Sand Lake Road
Jewel Lake Road
Northwood Street
C Street
Lore Road
Dimond Boulevard
Minnesota Drive
King Street
Old Seward Highway
Seward Highway
O'Malley Road
Birch Road
Klatt Road
Johns Road
Huffman Road
Chugach State Park

Environmental Constraints

- no constraints
- partially constrained
- significantly constrained
- prohibitively constrained
- fill site or other site specific conditions (e.g. peat)

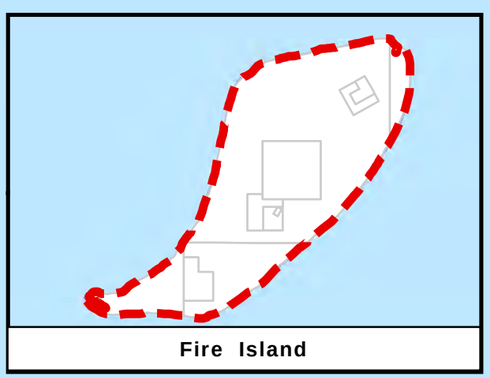
Urban Service Constraints

- Areas Unlikely to Receive Road Access (Fire Island)
- Areas Unlikely to Receive Water Service, for Purposes of Industrial Lands Assessment
- Areas Unlikely to Receive Sewer Service, for Purposes of Industrial Lands Assessment

Land Use Commitments

- Conservation Easements and Other Protections
- Designated Future Parkland or Open Space
- Future Residential, Commercial, or Civic / Institutional Use
- Future Road, Railroad, Port, Aviation, or Utility Use

- Industrial Lands Assessment Study Area Boundary



Fire Island

N

0 0.5 1 2 Miles

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Municipality of Anchorage
Anchorage Industrial Lands Assessment

Constraints on Industrial Development in Chugiak-Eagle River

Matanuska Susitna Borough
Municipality of Anchorage

Knik Arm

Eklutna Lake Rd

Glenn Highway

Voyles Blvd

Chugach State Park

Birchwood Loop Road

Joint Base
Elmendorf-Richardson

Old Glenn Highway

Glenn Highway

Alaska Railroad

Business Boulevard

Eagle River Loop Road

Eagle River Road

Driftwood Bay Drive

Hiland Road

Glenn Highway

Hiland Road

Chugach State Park

Environmental Constraints

- no constraints
- partially constrained
- significantly constrained
- prohibitively constrained
- fill site or other site specific conditions (e.g. peat)

Urban Service Constraints

- Areas Unllikely to Receive Road Access, for Purposes of Industrial Lands Assessment
- Areas Unlikely to Receive Sewer Service, for Purposes of Industrial Land Assessment
- Areas Unlikely to Receive Water Service, for Puroses of Industrial Lands Assessment

Land Use Commitments

- Conservation Easements and Other Protections
- Designated Future Parkland or Open Space
- Future Residential, Commercial, or Civic / Institutional Use
- Future Road, Railroad, Port, Aviation, or Utility Use

- Industrial Lands Assessment Study Area Boundary

N

0 0.5 1 2 Miles

Map 7

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Rating Buildable Lands into Three Tiers of Quality

Upon the recommendation of the industrial land assessment consultant, and in consultation with the project Advisory Committee, the buildable lands analysis divided the vacant, partially vacant, and marginal use land supply into three tiers of land quality, in order to estimate the effective buildable land supply for policy consideration purposes.

Tier 1 land supply consists of parcels a one acre or more in size among the vacant, partially vacant, and marginally used lands. The industrial lands consultant recommended a threshold of one acre as a standard threshold.

Tier 2 land supply consists of parcels between a half acre and one acre in size. Based on field observations and consultations, the half acre threshold was considered to be enough space needed to accommodate a majority of small- to medium-size establishments. Lands with partial environmental constraints, a lack of water or wastewater service, or not located in an industrial district were also included in Tier 2.

Tier 3 land supply consists of parcels less than a half acre in size among the vacant, partially vacant, and marginally used lands. These often are 6,000 to 10,000 square foot parcels. In addition, lots with significant environmental or urban service constraints were demoted to Tier 3.

Table 12. Screening Criteria for Tier 1, 2, and 3 Lands

	Tier 1	Tier 2	Tier 3
Lot Characteristics	**Lands with ALL of the following characteristics:**	**Lands with any one of the following, except Tier 3 lands:**	**Lots with any one of the following characteristics:**
Urban Services	Has water and wastewater Service	Has only one of either Water or Wastewater	Has neither Water nor Wastewater Service
Lot Size	Lot (or buildable part of partially vacant lot) is 1.0 acres or larger	Lot (or buildable part of partially vacant lot) is less than 1.0 acre, but not less than 0.5 acres	Lots (or buildable part of partially vacant lots) is less than 0.5 acres
Zoning	I-1, I-2, I-3, or PC, and not in International Airport Subarea	PLI, T, or in International Airport Subarea	
Environmental Constraints	No environmental constraints	Partial environmental constraints	Significant constraints

Factoring in the Commercial (Non-industrial) Utilization Rate

The estimate of industrial land supply takes into consideration the rate of non-industrial utilization of industrially zoned lands in the Anchorage Bowl and Chugiak-Eagle River.

As discussed in Section 1, the industrially zoned land base in the Anchorage Bowl has in recent years experienced increasing pressure by non-industrial uses. Many recently developed industrial parcels in the I-1 and I-2 zoning districts indicate a shift to commercial and other non-industrial uses. The 2012 *Anchorage Commercial Land Assessment* documented that much of the capacity to accommodate commercial office and retail needs is on land zoned for industrial uses. Industrial zoning districts are distinctive among the major categories of land supply that also include residential, commercial, institutional, and open space lands, because of the extent to which the industrial zones are developed for non-industrial uses from these other categories. While there are specific zoning districts designed to allocate space for office, institutional, and residential uses, and which protect retail commercial centers from industrial uses, Anchorage's industrial zoning, has been hierarchical rather than exclusive in nature. It has allowed other uses considered less intensive in their impacts than industrial activities. As a result, office, retail, and residential developers may compete for development rights to the remaining industrially zoned land supply. Market pressure for land conversions to non-industrial use is especially strong if a property has locational and physical attributes consistent with commercial needs.

Therefore, the net acreage of buildable land that is zoned or otherwise available for industrial use—even after deducting for site constraints—overestimates how much land is likely to be available for industrial development.

Based on consultations with the Industrial Land Assessment Advisory Committee, the industrial land supply estimate sought to take into account this non-industrial use. The analysis developed a conservative measure of existing non-industrial utilization of I-1 and I-2 land as a basis for estimating the commercial utilization rate going forward into the future. Although land market trends would seem to suggest an even higher commercial utilization rate in the future as the commercial-industrial land supply becomes more constrained, other trends such as stronger limitations on non-industrial uses in the land use regulations (primarily in the I-2) might have the opposite effect. Rather than attempt to forecast changes in the utilization rate, this inventory uses a scenario in which, on average across the Anchorage Bowl, the historical utilization rate carries forward for new development. Future analyses may further refine this basic approach by breaking out this utilization rate by zoning district (I-1 versus I-2) or type of location relative to transportation networks.

The results from the land use inventory were used to determine the existing utilization rate, using a two-step method. First, municipal planners calculated the percentage of industrial-zoned lands currently in use, not including those lands occupied by public utility/major transportation facilities, that is occupied by the following non-industrial NAICS sectors: retail trade, information, finance and insurance, professional and business services, education and health, leisure

and accommodations, personal and other services (except repair), and government. The findings in Section 4, showing the amount of acreage of I-1 and I-2 land currently utilized by economic sector, provide the basis for determining that percentage.

Table 13. Determining the Commercial Utilization Rate Percentage of Developed I-1 and I-2 Land, Anchorage Bowl, 2013-14

		X	=
Economic Sector (NAICS)	**% of Industrial Land**	**Non-industrial Share of Employment (%)**	**% of Industrial Land in Commercial Utilization**
Retail Trade	15.1		9.1
Retail Trade (except vehicles and heavy goods)	4.9	60	2.9
Vehicle Sales and Heavy Goods Retail	10.2	60	6.1
Communications and Information	1.2	90	1.1
Finance, Real Estate, Leasing, and Self-storage	7.3		6.9
Finance, Insurance, and Real Estate Services	1.3	95	1.2
Leasing, Equipment Rental, and Self-storage	6.0	95	5.7
Business, Professional, and Technical Services	11.3		2.8
Professional and Business Services	3.1	90	2.8
Services to Buildings and Facilities	1.9	0	0
Waste Management, Salvage, and Snow Disposal	6.3	0	0
Education and Health Services	3.0	90	2.7
Leisure and Accommodations	9.7	95	9.2
Personal and Other Services (except repair)	2.2	90	1.9
Government and Public Safety	2.8	99	2.8
TOTAL%	52.6		36.5

Secondly, planners multiplied the percentage of industrial lands used by each of the commercial sectors by the percentage share of non-industrial employment in each of these sectors. This second step is important, because a certain amount of the employment in these commercial sectors is in industrial-type activities. So, for example, if a particular commercial sector occupies 100 acres of industrial land in the city, but 10 percent of its employment and space usage is for industrial-type activities (e.g., warehousing or storage), then only 90 acres of industrial land are being put to non-industrial use (100 acres * 90 percent).

"Industrial Share" percentages provided by the Industrial Land Assessment consultant team were used in Table 13 to determine what percentage of employment in these commercial sectors was devoted to industrial versus non-industrial-type employment. For example, the Retail Trade sector occupies 15 percent of developed industrial land in the I-1 and I-2 districts in the Bowl. Per the consultant team's data, approximately 60 percent of employment in that sector is typically non-industrial. Therefore, the planners multiplied 15 percent x 60 percent to estimate that Retail Trade occupies 9 percent of industrial-zoned lands with non-industrial type activities.

Had this analysis assumed that 100 percent of the land used by retail sector uses would be non-industrial activities, the assumed non-industrial utilization rate would have been much higher—half of all industrially zoned land—and this report's estimate of the industrial land supply would be that much lower. Therefore, the two-step method represents a relatively conservative approach to estimating the existing non-industrial utilization rate.

The two-step method and its findings appear in Table 13. The analysis estimates that 36.5 percent of developed land in I-1 and I-2 in the Bowl is currently used for non-industrial employment. An identical analysis estimated the non-industrial utilization rate for Chugiak-Eagle River separately. The non-industrial utilization rate for Chugiak-Eagle River was found to be much lower, only 5.5 percent, half of that being churches. Table 14 shows how the non-industrial utilization rate was factored into the industrial land supply.

Table 14. Factoring in the Non-industrial Utilization Rate

Subareas	Rate of Utilization for Commercial Use in Industrial Districts	How the Buildable Lands Inventory Factors in the Commercial Utilization Rate
Anchorage Bowl	36.5 percent	Reduces the net buildable land supply by 36.5 percent in the Anchorage Bowl. Exceptions: does not affect JBER Boniface parcel or MOA former Native Hospital site.
Chugiak-Eagle River	5.5 percent	Reduces the net buildable land supply by 5.5 percent in Chugiak-Eagle River.

Section 4 Industrial Use Inventory

A primary objective of *Volume II: Industrial Land Inventory* is to classify the current use of industrial lands and other lands in the study area. Section 4 provides basic information about the Anchorage industrial land use economy and geographic patterns in industrial (and non-industrial) use. It accounts for the full range of active uses from the commercial, industrial, and public facility sectors, residential and open space uses, as well as documenting parcels in which there is currently no activity or establishment (i.e., "vacant"). The latter part of Section 4 documents historical and recent trends in industrial development densities, measured as Floor Area Ratio (FAR). The intent is to understand and characterize industrial and non-industrial use of industrial-zoned lands, including how much land is utilized by each economic sector. Understanding the current industrial land use and development patterns specific to Anchorage helps inform the projections in Volume I for future industrial land demand in the Municipality.

The following pages tabulate how much land in the industrial zoning districts and the overall study area is in use by each economic sector. Table 15 provides overall acreage totals by Economic Sector for the entire municipal study area. Tables 16 and 17 break out the Anchorage Bowl and Chugiak-Eagle River individually. The tabulations follow NAICS in categorizing economic sectors.

The reader may further ascertain from these tables how these sectors fall into the major industrial use categories of Distribution, Production and Repair that comprise Anchorage's industrial uses, as defined on pages 15–20. Each Economic Sector in the tables is followed by an acronym, P, D, R, or N. These identify the part of the local industrial economy where each sector belongs:

Main Parts of the Anchorage Industrial Economy

P = Production

D = Distribution

R = Repair

N = Non-industrial

The pages that follow describe the results of the inventory using a series of tables. Tables 15–17 provide the overall results by the Municipality, Anchorage Bowl, and Chugiak-Eagle River. Further elaboration regarding the North, Central, and South industrial subareas of the Anchorage Bowl are provided in Tables 18–20.

Existing use by economic function for each subarea is shown on Maps 8-15 at the end of Section 4.

Overall Results for Anchorage Bowl and Chugiak-Eagle River

Except for the major airport, railroad, and port transportation facilities, the category of industrial PDR sectors using more land than other industrial categories in the Municipality is the Production category, led by *manufacturing* and *natural resource production* sectors. These two sectors utilize approximately 420 acres of industrial-zoned land, and 520 acres total including non-industrial zones. Most of these establishments are a variety of small- to medium-sized uses—metal fabrication, sign fabrication, wood products and furniture building, rubber and foam products, food and beverage products, paper and printing, and others. There are larger manufacturers, including a 100-acre wood construction products manufacturer in the Birchwood Airport industrial park. The remaining area—approximately two-fifths—includes a relative handful of non-metallic mineral product and quarrying establishments on medium to large sites. The Production category also includes the power generation and water *utilities* and *construction* contracting enterprises, both of which are prevalent in the Municipality. *Construction* contractors—e.g., heavy construction, special trades, and machinery related—occupy 326 acres, and are the third-largest user of industrially zoned land among all PDR sectors. Contrary to expectations coming into this study, very little construction contractor use area is for materials storage lay-down yards. Most of this space is used for parking, storage, and maintenance of work vehicles and equipment, while the remainder is headquarters offices and assembly/work areas.

Distribution remains the principal category of industrial land use, when including the airport, railroad, and port facilities. The *transportation* sector comprised of the Anchorage International Airport, Merrill Field Airport, Birchwood Airport, Alaska Railroad, and Port of Anchorage occupies more industrial land in use than all other PDR sectors combined. Anchorage's name comes from its place in the regional and world transportation system. Even excluding these major transportation facilities, the *ground transportation services* sector—trucking and freight services, delivery services, towing, taxi, and other transportation services—is the second largest user of local industrial-zoned land among all PDR sectors, occupying 430.9 acres—nearly as much as the total of manufacturing and natural resource production. The *warehousing* sector, while not as prevalent in Anchorage as in some cities, remains among the top 10 PDR sectors for land area in the Municipality. The *wholesale trade* sector occupies 191.6 acres, and rounds out Anchorage's distribution category of PDR uses.

The *vehicle and equipment repair* sector is a relatively major user of industrial land in the Study Area, occupying 115 acres of industrial land and 147 total in the Study Area. (Even more repair uses—mostly auto minor repair—are located in B-3 zoning districts outside of the Study Area.) The greatest land user among the repair category sectors is *services to facilities/waste management services*. This category of uses includes snow removal services, landscaping, snow disposal sites, salvage yards, and, most especially, solid waste disposal facilities. When including non-industrial-zoned lands such as the regional landfill in Eagle River, this sector occupies approximately 640 acres.

Table 15. Total Acres Currently in Use, by Economic Sector Anchorage Bowl and Chugiak-Eagle River Study Areas, 2013-14

Economic Sector	Industrial Districts	All Districts in Study Area
Manufacturing and Natural Resource Production	418.5	520.0
Manufacturing (except non-metal. mineral prod.) – *P*	292.0	315.3
Non-metallic Mineral Products and Quarrying – *P*	126.6	203.6
Agriculture, Nurseries, and Tree Production – *P*	0	1.1
Construction – *P*	306.2	326.0
Vehicle and Equipment Repair – *R*	115.1	147.7
Utilities – Power, Water, and Sewage – *P*/*D*	151.1	465.5
Airport, Railroad, and Marine Transportation – *D*	928.0	3,641.0
Warehousing and Ground Transportation	430.9	498.1
Warehousing – *D*	92.9	100.5
Ground Transportation and Freight Services – *D*	338.0	397.6
Wholesale Trade – *D*	191.6	207.9
Retail Trade	378.4	503.9
Retail Trade (except vehicles and heavy goods) – *N*	122.4	178.6
Vehicle Sales and Heavy Goods Retail – *N*	256.1	325.4
Communications and Information – *N/P*	29.6	39.7
Finance, Real Estate, Leasing, and Self-storage	188.0	237.8
Finance, Insurance, and Real Estate Services – *N*	32.5	52.8
Leasing, Equipment Rental, and Self-storage – *N*	155.5	185.0
Business, Professional, and Technical Services	295.3	734.2
Professional and Business Services – *N*	77.7	97.6
Services to Buildings and Facilities – *R*	49.3	54.8
Waste Management, Salvage, and Snow Disposal – *R*	168.3	581.8
Education and Health Services – *N*	79.9	304.1
Leisure and Accommodations – *N*	89.8	1,419.2
Personal and Other Services (except repair) – *N*	69.7	108.3
Residences – *N*	52.3	197.8
Government and Public Safety – *N*	70.3	210.8

Non-industrial users compete with the PDR sectors for industrial zoned space. The three largest non-PDR sectors occupying industrial-zoned land include: vehicle sales and heavy goods retail (256 acres); self-storage, leasing, equipment rental (155 acres); and general retail (122 acres). Self-storage alone occupies more than 100 acres, making it a larger user of I-zone land than warehousing. Secondary users include leisure and accommodations (restaurants and hotels), professional and business services (professional office); education and health services; personal and other services; and government and public safety. Minor uses: residences occupy 50 acres, and financial and real estate offices occupy 33 acres. Major non-industrial users are often concentrated in commercial centers or corridors that have evolved in spite of industrial zoning—such as in the Abbott Town Center or Northway Town Center areas. Others, such as fitness clubs, martial arts studios and churches, appear to be distributed more evenly through the industrial districts. Table 15 indicates the greatest non-PDR user of land in the Study Area outside of industrial-zoned land is the *leisure and accommodations* sector. This sector includes parklands and greenbelts which also happen to run through and around the industrial areas of the community. Also, because the Study Area includes some B-3 and PLI zoned lands, Table 15 shows a significant amount of non-industrial land in office and institutional use.

Anchorage Bowl (Table 16)

Since most industrial activity is located in the Anchorage Bowl, there is relatively little variation between the industrial land use patterns of the Bowl and the Municipality as a whole.

The industrial sectors in the Production category including manufacturing, utilities and construction occupy more than 700 acres of industrial-zoned land, making Production the largest user of lands among local industrial categories (i.e., not including airports, port, and railroad operations). The Distribution category of sectors, including ground transportation, warehousing, and wholesale, occupy nearly 600 acres of industrial-zoned land.

However, *ground transportation and freight services* occupy more industrial and non-industrial land than any other individual PDR sector in the Bowl (308 acres—again excluding the major airport-port-railroad transportation facilities). The Production sectors of *construction* and *manufacturing* each occupy 300 acres of industrial-zoned land, rounding out the top three industrial land use sectors. However, after excluding the production of non-metallic mineral products, the manufacturing sector area drops to 178 acres. The fourth largest industrial sector in terms of land area is *wholesale trade*, occupying more than 190 acres of industrial-zoned land.

The Repair category sectors of *waste management* and *vehicle and equipment repair* are the fifth and sixth largest users of industrial land. The *waste management* sector including salvage and snow disposal occupies 157 acres of industrial land—and more than 260 acres total including other districts. The *vehicle and equipment repair* sector uses 113 acres of industrial-zoned land, and more than 145 acres total including other districts in the Study Area.

Table 16. Acres Currently in Use, by Economic Sector – Anchorage Bowl Anchorage Bowl Industrial Land Assessment Study Area, 2013-14

Economic Sector	Industrial Districts	All Districts in Study Area
Manufacturing and Natural Resource Production	298.8	320.4
Manufacturing (except non-metal. mineral prod.) – *P*	178.9	197.8
Non-metallic Mineral Products and Quarrying – *P*	119.9	121.5
Agriculture, Nurseries, and Tree Production – *P*	0	1.1
Construction – *P*	298.9	312.6
Vehicle and Equipment Repair – *R*	113.3	146.0
Utilities – Power, Water, and Sewage – *P*/*D*	105.5	165.1
Airport, Railroad, and Marine Transportation – *D*	743.3	3,456.3
Warehousing and Ground Transportation	400.6	424.2
Warehousing – *D*	92.0	99.5
Ground Transportation and Freight Services – *D*	308.6	324.7
Wholesale Trade – *D*	191.6	207.9
Retail Trade	378.0	502.3
Retail Trade (except vehicles and heavy goods) – *N*	122.4	178.2
Vehicle Sales and Heavy Goods Retail – *N*	255.6	324.1
Communications and Information – *N/P*	29.6	39.7
Finance, Real Estate, Leasing, and Self-storage	181.2	230.9
Finance, Insurance, and Real Estate Services – *N*	32.5	52.8
Leasing, Equipment Rental, and Self-storage – *N*	148.7	178.1
Business, Professional, and Technical Services	282.7	411.5
Professional and Business Services – *N*	77.7	97.6
Services to Buildings and Facilities – *R*	47.9	53.4
Waste Management, Salvage, and Snow Disposal – *R*	157.1	260.5
Education and Health Services – *N*	76.0	250.1
Leisure and Accommodations – *N*	242.0	1,277.0
Personal and Other Services (except repair) – *N*	53.7	90.1
Residences – *N*	32.2	157.4
Government and Public Safety – *N*	70.3	133.9

Other significant PDR sectors in the Bowl include *utilities* (105 acres of industrial-zoned land and 165 acres total); and services to buildings and facilities (~50 acres).

Of 3,500 acres of industrial-zoned land currently in use in the Bowl, nearly 37% is estimated to be in non-industrial use. Several commercial sectors appear to use as much or in some cases even more industrial-zoned land in the Bowl than the seven PDR sectors noted above. The non-PDR sectors using the most industrial-zoned land include:

1. Vehicle sales and heavy goods retail (255 acres)
2. Leisure and accommodations (242 acres including 97 acres of parkland)
3. Leasing, equipment rental, and self-storage (148 acres)
4. Retail trade (122 acres)
5. Professional and business services (77 acres)
6. Education and health services (76 acres)
7. Government and public safety (70 acres)

Drilling down further, primary individual commercial use types include fitness and athletic clubs (23 acres); eating and drinking establishments (56 acres); professional services (36 acres) lodging (14 acres); educational services (13 acres); administrative services (28 acres); self-storage rental (100 acres); lending institutions (20.6 ac); car dealers (75 acres); large vehicle sales (63 acres); and hardware and home centers (44 acres).

Some individual non-industrial use types are supportive to PDR sectors. Examples include trade schools (23 acres); certain professional or technical services; and leasing of industrial and commercial equipment (22 acres).

Chugiak-Eagle River (Table 17)

Two industrial clusters provide locally-serving industrial facilities in central Eagle River, with some parcels having highway access (see Map 12 at the end of this Chapter). The first consists of a small group of I-1 parcels on the west side of the Glenn Highway at Artillery Road and just north of Eagle River. A second cluster of local-serving industrial uses on the other side of the Highway lines the relatively flat western side of Spring Brook Drive with nearly a dozen small PDR establishments, including repair, manufacturing, transportation, warehousing, construction, and facility maintenance. In Chugiak, local industrial uses and quarries line the Old Glenn Highway in places between Birchwood Loop Road and Loretta French Park (Map 13). New clusters of local industrial uses may soon develop at Chugiak Pit at the north end of that area, and in the Eklutna Power Plant and Birchwood Airport areas further north.

Table 17. Acres Currently in Use, by Economic Sector – Chugiak-Eagle River
Chugiak-Eagle River Industrial Land Assessment Study Area, 2013-14

Economic Sector	Industrial Districts	All Districts in Study Area
Manufacturing and Natural Resource Production	119.7	199.6
Manufacturing (except non-metal. mineral prod.) – *P*	113.1	117.5
Non-metallic Mineral Products and Quarrying – *P*	6.6	82.1
Agriculture, Nurseries, and Tree Production – *P*	0	0
Construction – *P*	7.4	13.3
Vehicle and Equipment Repair – *R*	1.7	1.7
Utilities – Power, Water, and Sewage – *P*/*D*	45.6	300.3
Airport, Railroad, and Marine Transportation – *D*	184.7	184.7
Warehousing and Ground Transportation	30.3	74.0
Warehousing – *D*	1.0	1.0
Ground Transportation and Freight Services – *D*	29.3	73.0
Wholesale Trade – *D*	0	0
Retail Trade	0.4	1.0
Retail Trade (except vehicles and heavy goods) – *N*	0	0
Vehicle Sales and Heavy Goods Retail – *N*	0.4	1.0
Communications and Information – *N/P*	0	0
Finance, Real Estate, Leasing, and Self-storage	6.8	6.9
Finance, Insurance, and Real Estate Services – *N*	0	0
Leasing, Equipment Rental, and Self-storage – *N*	6.8	6.9
Business, Professional, and Technical Services	12.6	322.7
Professional and Business Services – *N*	0	0
Services to Buildings and Facilities – *R*	1.4	1.4
Waste Management, Salvage, and Snow Disposal – *R*	11.2	321.3
Education and Health Services – *N*	3.9	54.1
Leisure and Accommodations – *N*	0	141.5
Personal and Other Services (except repair) – *N*	16.0	18.2
Residences – *N*	20.1	40.3
Government and Public Safety – *N*	0	83.0

Primary local scale industrial uses include *ground transportation and freight services* (73 acres), *quarrying and non-metallic mineral products* (82 acres), *waste management* uses comprise salvage yards and solid waste collection (11 acres); *manufacturing* uses (>10 acres); and *construction contractors* (13 acres). Warehousing, vehicle and equipment repair, and services to buildings occupy 1-2 acres each.

However, local scale users occupy only a small proportion of industrial land in use in Chugiak-Eagle River. Most of the industrial acreage currently in use is concentrated into the following larger-scale facilities:

- Power and water utilities (300 acres total), including: the new Eklutna Power Generation Plant (45 acres), the AWWU water treatment plan (44 acres), the AWWU wastewater treatment plant, and natural gas and fossil fuel power plants around the regional landfill (208 acres);
- Birchwood Airport and adjacent Railroad facilities (184 acres);
- Anchorage Regional Landfill (178 acres);
- A wood construction materials manufacturing plant near Birchwood Airport (103 acres); and
- A 132-acre site in the Powder Reserve used for snow storage.

Industrially zoned lands in Chugiak-Eagle River have not experienced as much competition for space from non-PDR uses as have lands in the Anchorage Bowl. Retail uses occupy less than one acre of industrially zoned lands in Chugiak-Eagle River. Commercial offices occupy zero acres. The most common non-PDR users of industrial land are churches (16 acres), residences, and rental and self-storage uses.

North Anchorage Subarea (Table 18)

The pattern of industrial use in the North Anchorage subarea differs markedly from the Central and South Bowl areas, when comparing Maps 8, 9, and 10 (provided at the end of this chapter). North Anchorage, especially in and around the city's port, railroad, and general aviation airport facilities, has a much greater share of transportation, warehousing and distribution, which are color-shaded light grey on the maps. Ground transportation services and warehousing enterprises are especially common in the Ship Creek basin.

Table 18 tabulates this pattern: the largest industrially zoned acreage by economic sector in the North Anchorage subarea includes 686 acres of airport, railroad and marine transportation facilities (745 acres including other districts). The second largest acreage by economic sector encompasses warehousing and ground transportation with *ground transportation and freight services* being the most noteworthy usage (179 acres of industrial-zoned land, and 184 acres total).

Table 18. Acres Currently in Use, by Economic Sector – North Anchorage Subarea 2013-14

Economic Sector	Industrial Districts	All Districts in Subarea
Manufacturing and Natural Resource Production	43.8	61.2
Manufacturing (except non-metal. mineral prod.) – *P*	40.8	58.2
Non-metallic Mineral Products and Quarrying – *P*	3.0	3.0
Agriculture, Nurseries, and Tree Production – *P*	0	0
Construction – *P*	31.7	35.6
Vehicle and Equipment Repair – *R*	36.3	41.2
Utilities – Power, Water, and Sewage – *P*/*D*	20.3	72.1
Airport, Railroad, and Marine Transportation – *D*	686.0	745.1
Warehousing and Ground Transportation	205.8	216.5
Warehousing – *D*	26.2	31.7
Ground Transportation and Freight Services – *D*	179.6	184.8
Wholesale Trade – *D*	20.4	22.6
Retail Trade	97.3	142.8
Retail Trade (except vehicles and heavy goods) – *N*	33.7	56.2
Vehicle Sales and Heavy Goods Retail – *N*	63.6	86.6
Communications and Information – *N/P*	5.0	14.1
Finance, Real Estate, Leasing, and Self-storage	25.2	38.8
Finance, Insurance, and Real Estate Services – *N*	0.0	4.7
Leasing, Equipment Rental, and Self-storage – *N*	25.2	34.1
Business, Professional, and Technical Services	47.2	52.0
Professional and Business Services – *N*	4.5	7.5
Services to Buildings and Facilities – *R*	5.1	5.1
Waste Management, Salvage, and Snow Disposal – *R*	37.6	39.4
Education and Health Services – *N*	19.2	55.0
Leisure and Accommodations – *N*	85.4	143.6
Personal and Other Services (except repair) – *N*	11.9	18.7
Residences – *N*	4.8	89.8
Government and Public Safety – *N*	30.3	68.8

The third largest amount of industrial zoned acreage by economic sector falls under non-industrial uses: the retail trade category with vehicle sales and heavy goods retail is the largest component (97 acres total). While the leisure and accommodations category of uses also comprises a large number of acres, most of that is actually located in park and open space along Ship Creek.

In contrast to the Distribution uses, *manufacturing* and particularly *construction* contracting occupy less land proportionally in North Anchorage than in the other Bowl subareas. *Waste management and salvage* uses, including salvage yards and other enterprises that collocate near the railroad and port facilities, occupy nearly as much acreage as manufacturing, and more acreage than construction contractors. Power and water *utilities* occupy more acreage in North Anchorage than any other industrial sector except the transportation and distribution uses, because of the concentration of ML&P facilities in Ship Creek and east of Centennial Park near Muldoon.

Central Anchorage Subarea (Table 19)

As provided in Map 9, the Central Subarea includes a number of industrial clusters stretching from Minnesota Drive east to Lake Otis Parkway, and from 40th to south past 76th Avenue along the Old Seward Highway. The pattern of development in the Central subarea takes advantage of the major arterials of International Airport Road, C Street, Dowling Road, and the Old Seward Highway, and to some extent also the rail corridor and proximity to the International Airport.

Exhibiting a wide variety of industrial and non-industrial uses throughout the I-1 zone, the area includes warehousing transportation and freight services, fabrication, and other light industrial uses mixed with uses including office, retail, religious, and parkland. While there are some medium to large sites, there are a large number of single parcel developments on lots as small as 7,500 square feet. The clusters straddling C Street in the vicinity of Potter Drive south to 64th Avenue, in the corridor between Old and New Seward Highways south of Dowling, and south of East Dowling Road to Lake Otis together comprise the largest and most diverse array of small to medium sized industrial PDR establishments found anywhere in the Municipality. The I-2 district in Central Anchorage comprises relatively few large sites, including significant fabrication, quarrying, power generation, and distribution warehouse establishments.

Office-warehouse with residence

Small mining company building

Table 19. Acres Currently in Use, by Economic Sector – Central Anchorage Subarea 2013-14

Economic Sector	Industrial Districts	All Districts in Subarea
Manufacturing and Natural Resource Production	103.7	105.0
Manufacturing (except non-metal. mineral prod.) – *P*	69.2	70.3
Non-metallic Mineral Products and Quarrying – *P*	34.5	34.5
Agriculture, Nurseries, and Tree Production – *P*	0	0.2
Construction – *P*	116.8	123.6
Vehicle and Equipment Repair – *R*	59.5	80.1
Utilities – Power, Water, and Sewage – *P*/*D*	64.5	64.5
Airport, Railroad, and Marine Transportation – *D*	5.3	5.3
Warehousing and Ground Transportation	151.8	162.6
Warehousing – *D*	60.3	62.4
Ground Transportation and Freight Services – *D*	91.5	100.2
Wholesale Trade – *D*	84.5	94.6
Retail Trade	92.2	136.3
Retail Trade (except vehicles and heavy goods) – *N*	12.0	18.9
Vehicle Sales and Heavy Goods Retail – *N*	80.2	117.4
Communications and Information – *N/P*	17.3	17.5
Finance, Real Estate, Leasing, and Self-storage	73.7	86.7
Finance, Insurance, and Real Estate Services – *N*	21.7	24.7
Leasing, Equipment Rental, and Self-storage – *N*	52.0	62.0
Business, Professional, and Technical Services	100.7	107.4
Professional and Business Services – *N*	41.5	45.5
Services to Buildings and Facilities – *R*	14.0	16.4
Waste Management, Salvage, and Snow Disposal – *R*	45.2	45.5
Education and Health Services – *N*	30.1	62.4
Leisure and Accommodations – *N*	89.9	156.6
Personal and Other Services (except repair) – *N*	25.9	31.9
Residences – *N*	19.0	35.5
Government and Public Safety – *N*	12.4	14.8

The largest industrially zoned acreage by economic sector in the Central Anchorage subarea includes 152 acres of *warehousing and ground transportation*, with ground transportation and freight services (91 acres) being the predominant use. A related distribution sector, *wholesale trade*, also has significant acreage (84 acres).

The second largest amount of acreage by economic sector comprises *construction* (116 acres of industrial-zoned land). The third largest acreage by economic sector is *manufacturing* and *natural resources production* (103 acres) with manufacturing being the predominant land use. Combined with the power generation utilities acreage of CEA's Electron Drive campus, manufacturing and construction make Production the largest PDR category of industrial uses in the Central Bowl.

Vehicle and equipment repair occupy a relatively large amount of space – 59 acres of industrial-zoned land and 80 acres total, or more than half of all acreage in this use in the Bowl.

The largest non-industrial user of I-1 and I-2 zoned land in Central Anchorage are vehicle sales and heavy goods retail establishments, occupying more than 80 acres of industrial land primarily along the Old Seward Highway, C Street, and International Airport Road corridors. Leasing, rentals, and self-storage occupy 52 acres, and professional and business services offices occupy 41 acres, particularly in office parks along C Street between 40th and International Airport Road. Food and lodging uses occupy 46 acres, primarily along C Street.

South Anchorage Subarea (Table 20)

South Anchorage subarea is primarily a linear concentration of industrial land that straddles the railroad corridor north to south from the north end of King Street at East 76th Avenue, and south past O'Malley to Klatt Road. The corridor extends east to west from C Street to the Old Seward Highway. The area contains much of the Anchorage Bowl's most recent, and largest parcel industrial development, as well as many of the remaining undeveloped large parcels. Numerous large industrial users have developed the area with both building and yard intensive operations. The northern King Street end of this corridor is an industrial park subdivision of smaller I-1 parcels exhibiting well-established light industrial use. The south end of this major corridor also comprises smaller parcels and an industrial park, Huffman Business Park, which includes a greater mix of non-industrial uses that transitions into the Huffman Town Center designated commercial center at Huffman Road.

A secondary cluster of industrial uses exists east of the Seward Highway, with approximate boundaries being E. 76th Avenue in the north, Abbott Road in the south, Seward Highway in the west, and Lake Otis Parkway in the east. Some of this area has developed as a retail center. The highest utilization area for industrial uses is centered at the Cinnabar Loop, and a combination of construction supply, auto salvage, and other uses along East 79th Avenue. This area includes numerous small parcels that are used in combination with larger adjacent parcels and individually developed ones.

Table 20. Acres Currently in Use, by Economic Sector – South Anchorage Subarea 2013-14

Economic Sector	Industrial Districts	All Districts in Subarea
Manufacturing and Natural Resource Production	151.4	154.1
Manufacturing (except non-metal. mineral prod.) – *P*	68.9	69.2
Non-metallic Mineral Products and Quarrying – *P*	82.5	84.0
Agriculture, Nurseries, and Tree Production – *P*	0	0.9
Construction – *P*	150.7	153.4
Vehicle and Equipment Repair – *R*	17.6	24.7
Utilities – Power, Water, and Sewage – *P*/*D*	20.7	28.3
Airport, Railroad, and Marine Transportation – *D*	0.3	0.3
Warehousing and Ground Transportation	43.1	45.1
Warehousing – *D*	5.5	5.5
Ground Transportation and Freight Services – *D*	37.6	39.6
Wholesale Trade – *D*	86.7	90.7
Retail Trade	188.5	223.0
Retail Trade (except vehicles and heavy goods) – *N*	76.7	103.0
Vehicle Sales and Heavy Goods Retail – *N*	111.8	120.0
Communications and Information – *N/P*	7.2	8.1
Finance, Real Estate, Leasing, and Self-storage	82.4	105.4
Finance, Insurance, and Real Estate Services – *N*	10.8	23.4
Leasing, Equipment Rental, and Self-storage – *N*	71.6	82.0
Business, Professional, and Technical Services	117.0	133.5
Professional and Business Services – *N*	13.9	26.7
Services to Buildings and Facilities – *R*	28.9	32.0
Waste Management, Salvage, and Snow Disposal – *R*	74.2	74.8
Education and Health Services – *N*	26.7	41.7
Leisure and Accommodations – *N*	39.7	102.1
Personal and Other Services (except repair) – *N*	15.9	39.5
Residences – *N*	8.4	32.1
Government and Public Safety – *N*	9.7	10.5

Retail uses comprise the largest industrially zoned acreage by economic sector in the South Anchorage sub area. Vehicle sales and heavy goods retail is the predominant retail use; however, there are significant concentrations of general retail around Dimond Boulevard, South C Street, and Abbott Town Center.

The Production category of PDR uses—including manufacturing, non-metallic mineral products, and construction contractors—is far more prevalent in South Anchorage than are transportation and distribution uses. The largest amount of acreage by sector is essentially a draw between *manufacturing* (including non-metallic mineral production and quarrying) and *construction*. Construction contractors form the single largest sector using land, occupying 153 acres including all zoning districts.

AS&G non-metallic mineral products

Office/warehouse/production space

STG Wind Turbine contractor

Millwork plant

The third largest amount of acreage in South Anchorage is services to buildings and facilities combined with waste management, salvage, and snow disposal. *Wholesale trade* is the most prevalent sector in the PDR Distribution category, occupying 90 acres, compared to 45 acres of warehousing and ground transportation combined.

Food wholesale warehouse

Determining Patterns in Land Development Densities

Tables 21, 22, and 23 show trends in development density in the I-1 and I-2 districts, measured as Floor Area Ratio (FAR). FAR is calculated as the amount of building floor area divided by the area of the lot. This data may be compared with the FAR assumptions in the industrial demand forecasts.

Table 21 shows average FAR of existing development by economic sector. Tables 22 and 23 track historic and recent trends in development density. Table 22 includes developments without buildings, and so implies a lower FAR. Table 23 includes only those sites that have building floor area. Both Tables 22 and 23 indicate that development densities were higher in the 1970s and early 1980s than in the 1990s and 2000s. Table 23 suggests that recent development with buildings may be trending back toward the higher development densities experienced prior to the 1990s.

To further explore these recent trends, staff investigated the FAR of several recently constructed industrial buildings:

1. A small multi-tenant warehouse building located on West 68th Avenue was recently constructed with an FAR of .31 on its triangle-shaped lot. Individual businesses occupy the spaces (pictured below).

2. A condominiumized set of four warehouse style buildings, each with two tenant spaces, were constructed on East 100th Avenue with a FAR of .32 on the lot for the four buildings. Individual small businesses occupy the spaces (pictured below).

3. A new warehouse purpose-built on a small lot for a local brochure company is 2,800 sf and has an FAR of .33 on its lot.

4. A recent three-story office-warehouse building near Commercial Drive housing an environmental consulting firm with warehouse and office space for itself, and tenant office space, comes in at 0.56 FAR (pictured below).

Anchorage's Title 21 parking requirements for industrial uses were substantially reduced at the beginning of 2014. Historically, the parking requirements increased after the 1970s. The new, lower parking requirements may allow for higher densities than has been permitted in recent decades.

Table 21. Average FAR of Existing Development, by Economic Sector I-1 and I-2 Districts in Anchorage Bowl, 2013

Economic Sector	Number of Sites[11]	Average FAR
Construction	199	0.17
Manufacturing	116	0.32
Wholesale Trade	103	0.42
Retail Trade	58	0.30
Warehousing	31	0.48
Transportation	83	0.11
Utilities	13	0.06
Information	10	0.41
Financial and Real Estate	11	0.23
Leasing, Rental, and Self-storage	54	0.08
Business, Professional, and Technical Services	77	0.23
Waste Management and Salvage	34	0.07
Education and Health Services	22	0.26
Leisure and Accommodations	12	0.22
Other Services	58	0.32
Government and Public Safety	10	0.24

[11] For Tables 21, 22, and 23, establishments which crossed lot lines were calculated as a single unified site. The sample in Table 21 includes existing developed sites with no building floor area (FAR=0). The following were not included:

1. Properties not located in I-1, I-1 SL, I-2, and I-2 SL districts;
2. Alaska Railroad Lease Lots in the Ship Creek Terminal Reserve;
3. Properties in Merrill Field Airport and Anchorage International Airport;
4. Sites with more than three (3) different types of Economic Functions (i.e., many different types of businesses (FAR for lots with two or three types of establishments is reported by primary (largest) use type; and
5. Sites in which the primary building is non-industrial, such as commercial retail and office buildings, housing, and civic/institutional structures.

Table 22. Average FAR of Existing Developed Sites[12], by Historic Era
I-1 and I-2 Districts in Anchorage Bowl, 2013

Historic Era	Number of Sites	Average FAR
1969 and earlier	46	0.29
1970 - 1979	218	0.34
1980 - 1989	292	0.32
1990 - 1999	67	0.21
2000 - 2009	73	0.16
2010 - present	10	0.14

Table 23. Average FAR of Existing Developed Sites with Buildings, by Historic Era
I-1 and I-2 Districts in Anchorage Bowl, 2013

Historic Era	Number of Sites	Average FAR
1969 and earlier	42	0.32
1970 - 1979	207	0.36
1980 - 1989	281	0.33
1990 - 1999	65	0.21
2000 - 2009	58	0.20
2010 - present	5	0.29

[12] Table 22 includes developed sites without building floor area. Table 23 includes only sites with building floor area.

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Map 8

Municipality of Anchorage
Anchorage Industrial Lands Assessment

Existing Use by Economic Function

North Anchorage Subarea

- Parklands and Camping
- Residences
- Hotels and Accommodations
- Hospitality, Amusement and Food Services
- General Retail Sales and Services
- Vehicles and Heavy Goods Sales and Services; Leasing and Rentals; Mini-Storage and Outdoor Storage Rentals
- Business, Technical, and Professional Services
- Education, Public Administration, Healthcare, and other Institutional
- Mix of Industrial with Some Business/Trade
- Construction and Facility Maintenance Contractors
- Manufacturing, Mining, and Agriculture
- Vehicle and Equipment Repair
- Wholesale Trade
- Transportation and Warehousing
- Water and Power Utilities; Waste Management and Salvage
- Function Not Yet Determined
- Vacant

Zoning Boundary
Study Area Boundary

N

0 500 1,000 2,000 Feet

Northeast Bowl Inset

Boniface Parkway Inset

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Map 9

Municipality of Anchorage
Anchorage Industrial Lands Assessment

Existing Use by Economic Function

Central Anchorage Subarea

- Parklands and Camping
- Residences
- Hotels and Accommodations
- Hospitality, Amusement and Food Services
- General Retail Sales and Services
- Vehicles and Heavy Goods Sales and Services; Leasing and Rentals; Mini-Storage and Outdoor Storage Rentals
- Business, Technical, and Professional Services
- Education, Public Administration, Healthcare, and other Institutional
- Mix of Industrial with Some Business/Trade
- Construction and Facility Maintenance Contractors
- Manufacturing, Mining, and Agriculture
- Vehicle and Equipment Repair
- Wholesale Trade
- Transportation and Warehousing
- Water and Power Utilities; Waste Management and Salvage
- Function Not Yet Determined
- Vacant

Zoning Boundary
Study Area Boundary

N

0 500 1,000 2,000 Feet

Spenard Road
Wisconsin Street
Northwood Drive
West Tudor Road
East Tudor Road
Seward Highway
West International Airport Road
East International Airport Road
West Potter Drive
East Potter Drive
Minnesota Drive
East Dowling Road
Raspberry Road
Arctic Boulevard
C Street
Northwood Street
Strawberry Road
East 76th Avenue
Old Seward Highway
Homer Drive
King Street
Lore Road
Lake Otis Parkway
West Dimond Boulevard
East Dimond Boulevard
Abbott Road

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Municipality of Anchorage
Anchorage Industrial Lands Assessment

Existing Use by Economic Function

International Airport Subarea

- Parklands and Camping
- Residences
- Hotels and Accommodations
- Hospitality, Amusement and Food Services
- General Retail Sales and Services
- Vehicles and Heavy Goods Sales and Services; Leasing and Rentals; Mini-Storage and Outdoor Storage Rentals
- Business, Technical, and Professional Services
- Education, Public Administration, Healthcare, and other Institutional
- Mix of Industrial with Some Business/Trade
- Construction and Facility Maintenance Contractors
- Manufacturing, Mining, and Agriculture
- Vehicle and Equipment Repair
- Wholesale Trade
- Transportation and Warehousing
- Water and Power Utilities; Waste Management and Salvage
- Function Not Yet Determined
- Vacant

- Zoning Boundary
- Study Area Boundary

N

0 500 1,000 2,000 Feet

Point Woronzof Drive
West Northern Lights Boulevard
Postmark Drive
Northwood Drive
West Tudor Road
West International Airport Road
Raspberry Road
Jewel Lake Road

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Municipality of Anchorage
Anchorage Industrial Lands Assessment

Existing Use by Economic Function

South Anchorage Subarea

- Parklands and Camping
- Residences
- Hotels and Accommodations
- Hospitality, Amusement and Food Services
- General Retail Sales and Services
- Vehicles and Heavy Goods Sales and Services; Leasing and Rentals; Mini-Storage and Outdoor Storage Rentals
- Business, Technical, and Professional Services
- Education, Public Administration, Healthcare, and other Institutional
- Mix of Industrial with Some Business/Trade
- Construction and Facility Maintenance Contractors
- Manufacturing, Mining, and Agriculture
- Vehicle and Equipment Repair
- Wholesale Trade
- Transportation and Warehousing
- Water and Power Utilities; Waste Management and Salvage
- Function Not Yet Determined
- Vacant

Zoning Boundary

Study Area Boundary

N

0 500 1,000 2,000 Feet

Map 11

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Municipality of Anchorage
Anchorage Industrial Lands Assessment

Existing Use by Economic Function

Eagle River Subarea

- Parklands and Camping
- Residences
- Hotels and Accommodations
- Hospitality, Amusement and Food Services
- General Retail Sales and Services
- Vehicles and Heavy Goods Sales and Services; Leasing and Rentals; Mini-Storage and Outdoor Storage Rentals
- Business, Technical, and Professional Services
- Education, Public Administration, Healthcare, and other Institutional
- Mix of Industrial with Some Business/Trade
- Construction and Facility Maintenance Contractors
- Manufacturing, Mining, and Agriculture
- Vehicle and Equipment Repair
- Wholesale Trade
- Transportation and Warehousing
- Water and Power Utilities; Waste Management and Salvage
- Function Not Yet Determined
- Vacant

Zoning Boundary
Study Area Boundary

N

0 500 1,000 2,000 Feet

Powder Reserve

Artillery Road

Anchorage Regional Landfill

Glenn Highway

Eklutna Park Drive

Old Glenn Highway

Business Boulevard

North Eagle River Loop Road

Spring Brook Drive

Eagle River Road

Eagle River Loop Road

Map 12

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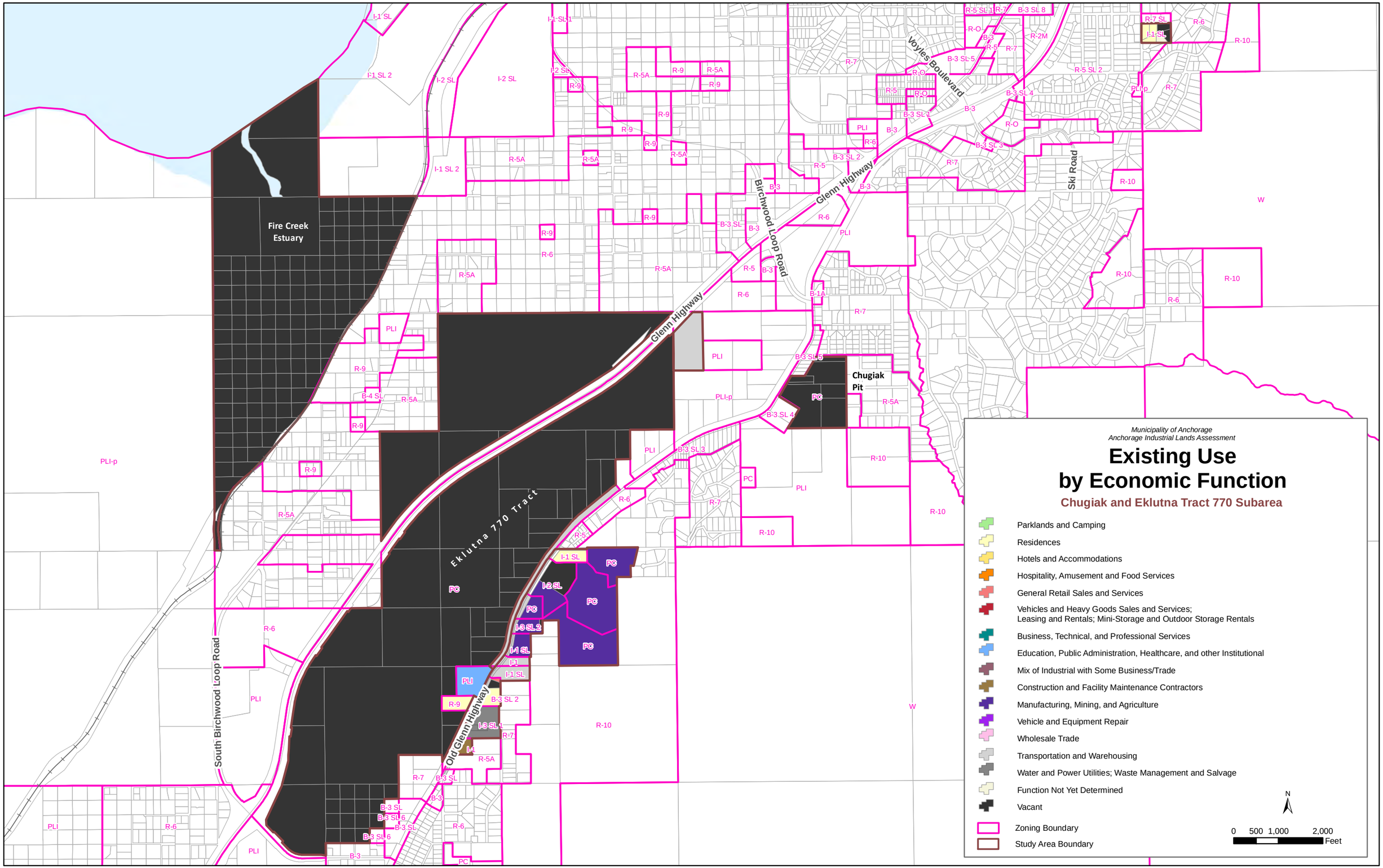

Municipality of Anchorage
Anchorage Industrial Lands Assessment

Existing Use by Economic Function

Chugiak and Eklutna Tract 770 Subarea

- Parklands and Camping
- Residences
- Hotels and Accommodations
- Hospitality, Amusement and Food Services
- General Retail Sales and Services
- Vehicles and Heavy Goods Sales and Services; Leasing and Rentals; Mini-Storage and Outdoor Storage Rentals
- Business, Technical, and Professional Services
- Education, Public Administration, Healthcare, and other Institutional
- Mix of Industrial with Some Business/Trade
- Construction and Facility Maintenance Contractors
- Manufacturing, Mining, and Agriculture
- Vehicle and Equipment Repair
- Wholesale Trade
- Transportation and Warehousing
- Water and Power Utilities; Waste Management and Salvage
- Function Not Yet Determined
- Vacant

Zoning Boundary
Study Area Boundary

N

0 500 1,000 2,000 Feet

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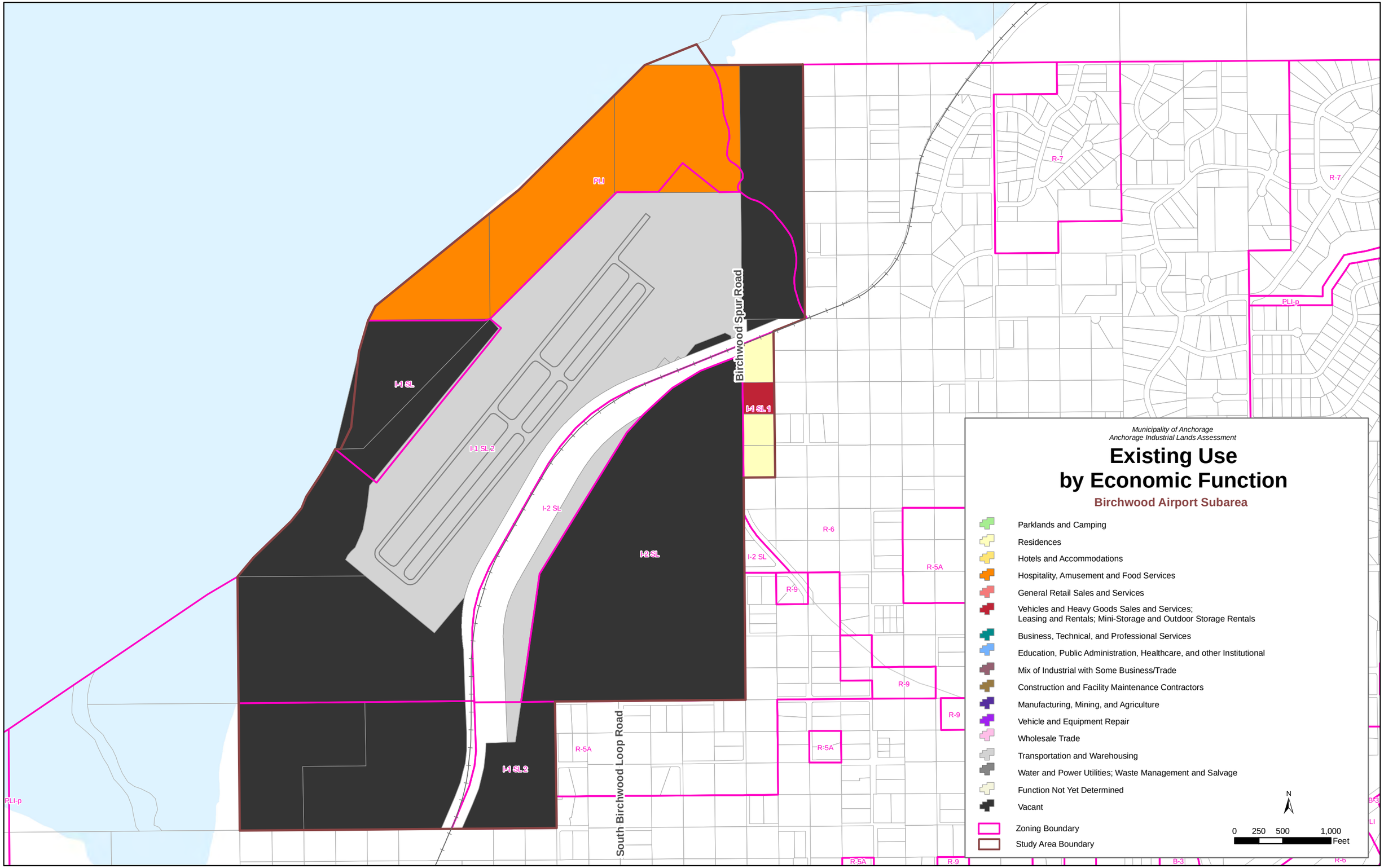
Map 14


PLI
I-1 SL
I-1 SL 2
I-2 SL
I-2 SL
I-1 SL 1
I-1 SL 2
Birchwood Spur Road
South Birchwood Loop Road
R-7
R-7
PLI-p
R-6
I-2 SL
R-5A
R-9
R-9
R-9
R-5A
R-5A
R-5A
R-9
B-3
B-3
LI
R-6
PLI-p
Municipality of Anchorage
Anchorage Industrial Lands Assessment
Existing Use
by Economic Function
Birchwood Airport Subarea
Parklands and Camping
Residences
Hotels and Accommodations
Hospitality, Amusement and Food Services
General Retail Sales and Services
Vehicles and Heavy Goods Sales and Services;
Leasing and Rentals; Mini-Storage and Outdoor Storage Rentals
Business, Technical, and Professional Services
Education, Public Administration, Healthcare, and other Institutional
Mix of Industrial with Some Business/Trade
Construction and Facility Maintenance Contractors
Manufacturing, Mining, and Agriculture
Vehicle and Equipment Repair
Wholesale Trade
Transportation and Warehousing
Water and Power Utilities; Waste Management and Salvage
Function Not Yet Determined
Vacant
Zoning Boundary
Study Area Boundary
N
0 250 500 1,000
Feet

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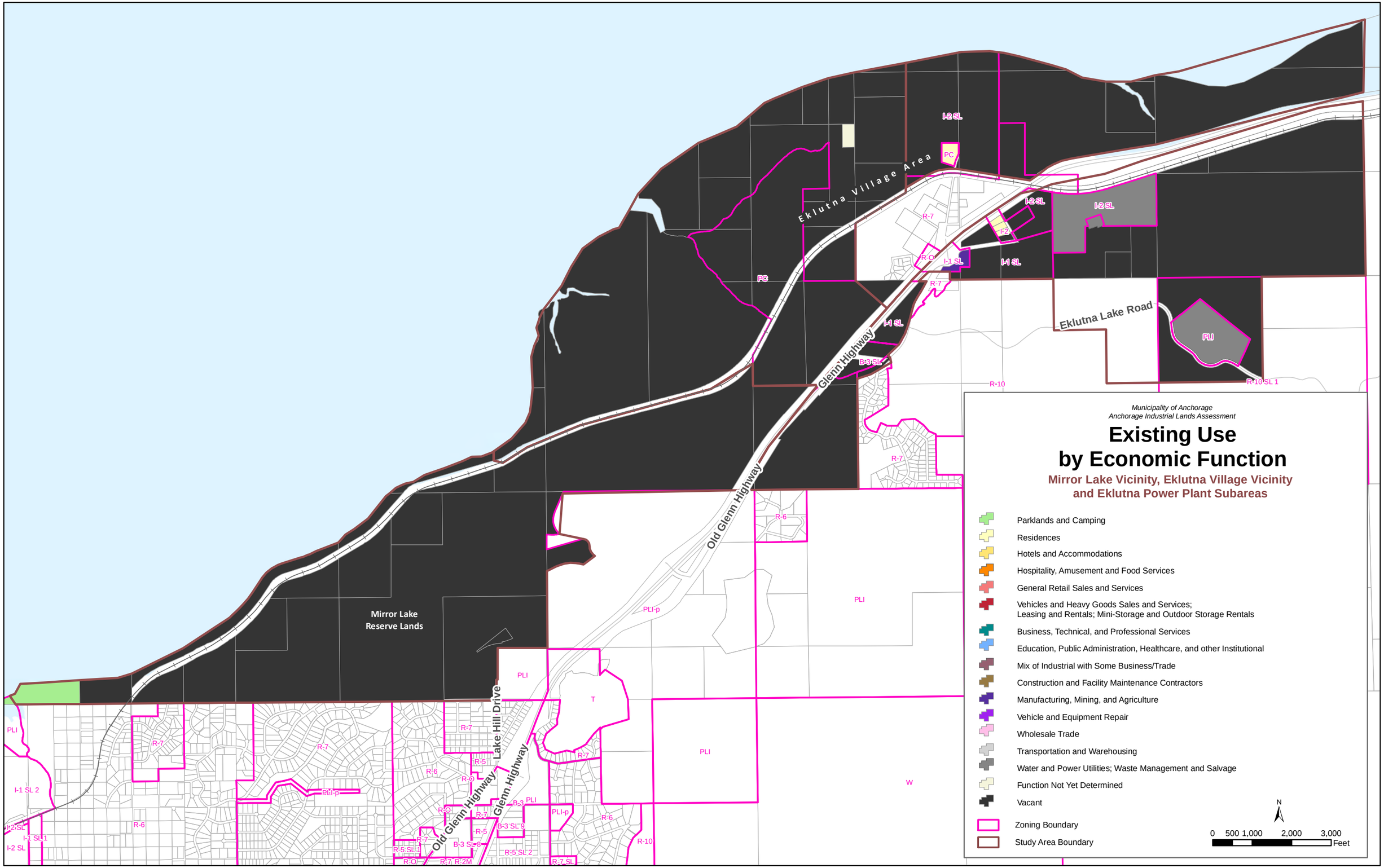
I-2 SL
PC
Eklutna Village Area
R-7
I-2
I-2 SL
I-2 SL
R-O
I-1 SL
I-1 SL
PC
R-7
I-1 SL
Eklutna Lake Road
PLI
Glenn Highway
B-3 SL
R-10
R-10 SL 1
Municipality of Anchorage
Anchorage Industrial Lands Assessment
Existing Use
by Economic Function
Mirror Lake Vicinity, Eklutna Village Vicinity
and Eklutna Power Plant Subareas
Parklands and Camping
Residences
Hotels and Accommodations
Hospitality, Amusement and Food Services
General Retail Sales and Services
Vehicles and Heavy Goods Sales and Services;
Leasing and Rentals; Mini-Storage and Outdoor Storage Rentals
Business, Technical, and Professional Services
Education, Public Administration, Healthcare, and other Institutional
Mix of Industrial with Some Business/Trade
Construction and Facility Maintenance Contractors
Manufacturing, Mining, and Agriculture
Vehicle and Equipment Repair
Wholesale Trade
Transportation and Warehousing
Water and Power Utilities; Waste Management and Salvage
Function Not Yet Determined
Vacant
Zoning Boundary
Study Area Boundary
N
0 500 1,000 2,000 3,000
Feet
R-7
R-6
PLI
PLI-p
T
W
Old Glenn Highway
Lake Hill Drive
Glenn Highway
R-5
R-O
B-3
B-3 SL 9
B-3 SL 8
R-5 SL 1
R-5 SL 2
R-7 SL
R-7
R-2M
I-1 SL 2
I-2 SL
I-1 SL 1
I-2 SL
Mirror Lake
Reserve Lands

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Section 5 Industrial Land Supply

Section 5 presents the estimate of buildable industrial land supply and the holding capacity of these lands to support additional industrial development. It provides an overall summary and then estimates by zoning district and geographic subarea. The estimate of buildable land acreage is matched with the forecasted industrial land demand in Volume I of this Industrial Land Assessment to determine the adequacy of the buildable land supply to accommodate the forecasted industrial development demand.

Summary of Land Supply Findings

Tables 25–27 quantify the net supply of buildable industrial land in the Anchorage Bowl and Chugiak-Eagle River, including both industrial and non-industrial-zoned lands, and publicly owned parcels, that are likely to be available for industrial development. The net buildable land supply includes unconstrained, partially constrained, and significantly constrained lands. It only includes acreage that is likely to be available for new industrial development within the planning horizon. Table 24 shows the process of determining the net buildable acreage from the gross acres of land supply within the study area:

Table 24. Process of Determining Net Buildable Land Supply from Gross Acres

Gross Industrial Land Supply in the Study Area (from Tables 10 and 11)
subtract Transportation Facility and Utility Facility Lands
subtract Prohibitively Constrained Lands
remove lands currently in use that may be "Redevelopable"[13]
equals Net Industrial Land Supply
deduct percentage of partly constrained Lands
equals Net Buildable Industrial Land Supply
deduct for commercial utilization rate
subtract lands anticipated to be lost to public infrastructure
equals Net Buildable Industrial Land Supply Available for Industrial Development

[13] Industrial development capacity of redevelopable lands is discussed separately on page 103.

Anchorage Bowl Land Supply

Anchorage Bowl Land Supply: High-Range Estimate

The Anchorage Bowl has up to 231.6 acres of buildable, industrial-zoned land available for industrial development (see Tables 25 and 26). This high-range estimate considers site constraints to development, removes parcels committed to a non-industrial use, and factors in the rate of non-industrial utilization of industrially zoned lands in the Bowl. (For comparison, the net acreage of industrial lands before factoring in the rate of non-industrial utilization is provided in Volume III: Appendix, of this report). The land included in the 231.6 acres comprises all of the net buildable vacant, partially vacant, and marginally used parcels zoned I-1 and I-2 in the Bowl.

The majority of this acreage consists of small infill parcels of between one-half acre up to several acres in size, scattered across the industrial districts of Central and South Anchorage. A handful of large vacant sites remain in the I-1 and I-2 land supply. Largest among these is the 38.6-acre former Granite Construction parcel (two lots) zoned I-2 in the Central Anchorage Subarea. Central Anchorage also has a sizeable cluster of developable lots to the north and east of the Carr-Gottstein Food Distribution Warehouse near 64th Avenue. Most other medium to large vacant or marginally used sites remaining in the Bowl are located in the South Anchorage subarea. A more detailed characterization of the land supply for each subarea is provided below.

Table 25 shows that, in addition to the 231.6 acres of I-1 and I-2 zoned land supply, up to 156.8 acres of buildable land is estimated in Table 25 to be available for industrial development in the PLI (Public Lands and Institutions) and T (Transition) districts—albeit subject to restrictions. The PLI and T districts include lands such as the following:

- A JBER parcel comprising the northeast quadrant at the intersection of Boniface Parkway and Glenn Highway, which is anticipated to transfer to Eklutna, Inc., and provide an estimated 77 acres of land for light industrial use; and

- Four large tracts of International Airport land that will be available for long-term leases for non-aviation uses, comprising approximately 87 acres of buildable, available land after factoring non-industrial utilization rates in the Bowl.

- The former Native Hospital site, located north of 3rd Avenue and west of Ingra Street, zoned PLI and comprising 5.7 acres of buildable, available land.

Including this PLI- and T-zoned land in addition to the industrial-zoned lands, up to 388.3 acres of buildable land supply acreage would be provided in the Bowl.

The estimate of industrial land supply does not include lands that are committed to future public utility operations, military operations, or airport, port, or railroad transportation operations. These facility lands mostly meet and exceed the projected land needed for the public utility and airport, railroad, and port transportation facility sectors. The only exception is that Table 25 anticipates a loss of 36.2 acres of industrially zoned land to future public utility and transportation facility expansions, including planned future roadway, airport, and power generation plant development. Therefore, the land supply estimate provided in this Section is what is anticipated to be available to all the other industrial sectors—including production, distribution, and repair activities—besides the utilities, airports, railroad, and port sectors.

The estimate of buildable land available to industrial development is also influenced by the anticipated rate of utilization of the industrial land supply by commercial and other non-industrial uses. The non-industrial utilization stems from permissive zoning regulations and market pressure for land conversions to commercial and institutional use. As discussed in Section 3, the lands analysis estimates that 36.5 percent of developed land in I-1 and I-2 in the Bowl is currently used for non-industrial employment.

All of these factors contribute to a limited supply of industrial-zoned land remaining in the Bowl. This finding corroborates the comments and observations of dozens of industrial business owners, managers, and employees who municipal planners spoke with during the field inventory for this project. The common refrain heard during the field inventory interviews was that there is very little available industrial land left, making land and industrial space difficult to find or expensive.

Table 25. Net Buildable Acres of Industrial Land after Factoring in Site Constraints and Commercial Utilization Rate Anchorage Bowl, by Subarea and Zoning, 2014

	I-1	I-2	Industrial Districts Subtotal	PLI	T	All Districts Total
Tier 1 Land Supply						
North Anchorage	15.8	11.2	27	0	0	27
International Airport	0	0	0	0	0	0
Central Anchorage	39.1	29.3	68.5	0	0	68.5
South Anchorage	35.6	37.8	73.4	0	0	73.4
Tier 1 Total	90.6	78.3	**168.8**	0	0	**168.8**
Tier 2 Land Supply:						
North Anchorage	7.5	1.4	8.9	1.4	77	87.3
International Airport	9.2	0	9.2	58.5[14]	9.8	77.5
Central Anchorage	19.8	0	19.8	6.7	0.2	26.7
South Anchorage	19.9	2.0	22.0	0	0.9	22.8
Tier 2 Total	56.4	3.4	**59.8**	66.6	87.9	**214.3**
Tier 3 Land Supply:						
North Anchorage	2.5	3.3	5.8	2.2	0	8.0
International Airport	0	0	0	0	0	0.0
Central Anchorage	17.5	0	17.5	0	0	17.5
South Anchorage	8.0	7.9	15.8	0	0	15.8
Tier 3 Total	28.0	11.2	**39.1**	2.2	0	**41.4**
Total Supply:						
North Anchorage	25.8	15.8	41.7	3.6	77	122.3
International Airport	9.2	0	9.2	58.5	9.8	77.5
Central Anchorage	76.4	29.3	105.8	6.7	0.2	112.7
South Anchorage	63.5	47.7	111.2	0.0	0.9	112.1
Tiers 1–3 Total Supply	174.9	92.9	**267.8**	68.9	87.9	**424.5**
Anticipated Losses	-23.5	-12.7	**-36.2**	0	0	**-36.2**
Total Adjusted Supply:	**151.4**	**80.2**	**231.6**	**68.9**	**87.9**	**388.3**

[14] The Airport suggested adding its 39-acre former FCC site to the industrial land inventory. While *not included in the buildable lands estimate, it is discussed in the Airport subsection below.*

Anchorage Bowl Land Supply: Low-Range Estimate

It is a question as to whether some of the parcels included in the Table 25 inventory will in fact be available for industrial development within the planning horizon. Table 26 on the following page provides a low- and high-range estimate of the amount of acres in the Bowl may actually be available.

The top half of Table 26 provides the high-end range estimate which includes all of the lands from Table 25. The high-range estimate of land supply is 388.3 acres, comprising 231.6 acres of industrially zoned land and 156.8 acres of T and PLI land.

This high-range estimate includes the small lots scattered around the Bowl (the "bread crumbs"), including those less than one-half acre in size. These consist of about 10 percent, or 26 acres, of the overall estimate for the Bowl, and are not considered optimal for medium- or larger-size establishments. It also includes lands with partial and significant environmental constraints (the "bottom of the barrel" lands), which may be more expensive and difficult for industrial users to develop. Likewise, parcels not anticipated to receive urban water or wastewater service within the planning horizon are also included.

The high-range estimate from Table 25 also includes those parcels in the net supply whose availability for industrial development is uncertain or questionable. Uncertain parcels include the JBER Boniface, which the municipal Planning Division estimates has potential to provide 77 acres of buildable land supply if JBER, the Municipality, and Eklutna, Inc., reach a three-party land exchange agreement, as discussed in the JBER section below.

The bottom half of Table 26 provides the low-end range estimate of available net buildable industrial land supply. The low-range estimate of land supply for the Anchorage Bowl is 209 acres, comprising 132.6 acres of industrial-zoned land and 76.4 acres of non-industrial (mostly PLI) land.

The low-range estimate includes parcels of a minimum one acre size to accommodate a majority of industrial users, with no environmental constraints, that either currently receive or will receive water and wastewater services, and that are zoned for industrial use. These comprise the "Tier 1" lands discussed in Section 3.

The low-range estimate excludes lands in the net supply inventory from Table 25 that are currently zoned T (Transition), whose availability for industrial development is uncertain—for example, the JBER Boniface site. The exception is that the low-range estimate does include Ted Stevens Anchorage International Airport property currently zoned T, which the Airport anticipates making available for commercial and industrial leases, and municipal land that seems most likely to be available for future industrial rezoning or use.

Table 26. Range Estimate of Available Net Buildable Industrial Land Supply, Anchorage Bowl, in Acres, by Zoning, 2014

	I-1	I-2	Industrial Districts Subtotal	PLI	T	All Districts Total
High-Range Estimate:						
Total Acreage	174.9	92.9	267.8	68.9	87.9	424.5
Anticipated Losses	-23.5	-12.7	-36.2	0	0	-36.2
Total Adjusted Acreage	**151.4**	**80.2**	**231.6**	**68.9**	**87.9**	**388.3**
Low–Range Estimate						
Total Acreage	90.6	78.3	168.8	66.6	9.8	245.2
Anticipated Losses	-23.5	-12.7	-36.2	0	0	-36.2
Total Adjusted Acreage	**67.1**	**65.6**	**132.6**	**66.6**	**9.8**	**209**

Even the low-range estimate may in some ways overstate the supply of industrial land likely to be available for industrial use. It includes some large sites that may experience greater site-specific pressure to convert to commercial use. For example, both low- and high-range estimates depend on the availability of these parcels:

- A partly improved site owned by Wal-Mart, located north of Dowling Road between the Old and New Seward Highways, comprising 14 acres of buildable industrial land supply in Tables 25 and 26.
- A cluster of medium-size vacant and partially vacant parcels owned by the Alaska Railroad and the municipal Heritage Land Bank between Reeve Boulevard and Commercial Drive, comprising 20 acres.
- Some medium- to large-size tracts along C Street which may be under market pressure to develop as commercial use, including an I-1 zoned property on the west side of C Street north of International Airport Road comprising 4.4 acres of buildable industrial land supply in Tables 25 and 26, and a cluster of I-2 zoned lots between 104th Avenue and Minnesota Drive, south of the new Cabela's store that comprises 9.3 acres in Tables 25 and 26.

Map 16. Net Supply of Buildable Industrial Land – Anchorage Bowl

Placeholder (map under development)

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Anchorage Bowl Redevelopment Potential

Depending on market conditions, cost and other factors, theoretically nearly all or almost none of Anchorage's industrial land base might redevelop within a given period.

Many industrial lots have few improvements: a low floor-to-area-ratio (FAR) and a low building-value-to-lot-value-ratio (BLVR). Therefore, these parcels might be considered to have a high redevelopment potential for a higher intensity industrial use.

However, most of these lots are in fact fully utilized by the business for equipment parking, maneuvering, storage, and maintenance that is integral to the enterprise. Industrial businesses such as contractors with heavy equipment need ample outdoor space. Redevelopment at higher intensities seems more prone to commercial rather than industrial use. For industrial purposes there may be little net gain in industrial space or employment over the previous use of the lot.

Table 27 uses assumptions about FAR and BLVR to identify which lands and subareas may be relatively more likely to experience redevelopment at an assumed redevelopment rate for the Anchorage Bowl. It illustrates one scenario for the types of lots and acreage of lands that might redevelop if Anchorage's "redevelopment rate"—i.e., percentage of industrial development that occurs through redevelopment instead of on vacant lands—were to exceed 33 percent over the planning time period. It assumes that lots with a FAR of less than 0.10 and a Building-to-Lot-Value Ratio (BLVR) of less than 0.75 redevelop such that the difference in intensity between previous and new industrial use on the lot is equal to the prevailing density of industrial development in the Bowl.

Table 27. Redevelopable Industrial Lands – Anchorage Bowl with FAR <0.1 and BLVR <0.75 and Factoring in Commercial Utilization Rate Anchorage Bowl, by Subarea and Zoning, 2014

	I-1	I-2	Subtotal	PLI	T	Total
North Anchorage	17.3	6.9	24.3	0	0	24.3
International Airport	0.0	0.0	0.0	0	0	0.0
Central Anchorage	72.8	0.9	73.7	0	0	73.7
South Anchorage	57.1	53.0	110.2	0	0	110.2
Total Redevelopable	**147.3**	**60.9**	**208.2**	**0**	**0**	**208.2**

Chugiak-Eagle River Land Supply

Table 28 estimates that Chugiak-Eagle River has 187.4 acres of buildable, industrial-zoned land available for industrial development. This acreage comprises all vacant, partially vacant, and marginally used parcels that remain in the I-1, I-2 and I-3 districts in Chugiak-Eagle River. The estimate accounts for partial and prohibitive site constraints to development, removes parcels committed to a non-industrial use, and factors in the rate of non-industrial utilization of industrially zoned lands.

Chugiak-Eagle River industrial lands experience a far lower non-industrial utilization rate than does the Anchorage Bowl. Only 5.5 percent of developed land in I-1 and I-2 in Chugiak-Eagle River is currently used for non-industrial use—and half of that non-industrial use consists of religious institutions.

The land supply estimate in Chugiak-Eagle River is impacted by the lack of wastewater service in much of the community. As discussed in Section 3, the land inventory assumes that parcels unlikely to receive wastewater service during the planning horizon will, on average, develop at only 50 percent of the capacity of lots with sewer service. This assumption, which was developed in consultation with the project's Advisory Committee, impacted the acreage count in the Powder Reserve, Birchwood, Chugiak, and Eklutna subareas.

Although substantial tracts of undeveloped lands exist in Chugiak-Eagle River, the estimate of industrial land supply does not include military lands, public utility facility lands, or lands that are determined to be unlikely to receive road access during the planning horizon. Besides Fire Island west of the Bowl, large tracts of Eklutna land west of Mirror Lake and north of the Eklutna Power Generation Plant are seen as unlikely to receive road access within the time horizon, under current trends and policy scenarios. In addition, the Mink Creek wetland tracts, the Eklutna River Estuary, and the Fire Creek Estuary located southwest of Birchwood Airport have recently been placed in conservation easements. The follow section discusses these prohibitively constrained areas.

Therefore, only 190.9 acres of buildable non-industrial-zoned land, mostly PC (Planned Community) and T (Transition), is estimated to be available for industrial development within the planning horizon. This additional land brings the total supply in Chugiak-Eagle River to 378.2 acres. Available PC and T lands mainly include:

- 120.9 acres of Eklutna land in Tract B of the Powder Reserve.
- Northern portions of the Eklutna 770 Tract that, after considering site constraints, may be developable for industrial use.
- 10.9 acres of T zoned land south of the new Eklutna Power Generation Plant, which may be developable for industrial use.

Table 28. Net Buildable Acres of Industrial Land after Factoring in Site Constraints and Commercial Utilization Rate Chugiak-Eagle River, by Subarea and Zoning, 2014

	I-1	I-2	I-3	I-zones Subtotal	PC	PLI	T	Total
Tier 1 Supply:								
Eagle River	28.7	12.7	0	41.4	0	0	0	41.4
Powder Reserve	0	0	0	0	0	0	0	0
Chugiak with 770	0	0	0	0	0.1	0	0	0.1
Birchwood Airport	0	0	0	0	0	0	0	0
Eklutna Vicinity	0	0	0	0	0	0	0	0
Tier 1 Total	28.7	12.7	0	**41.4**	0.1	0	0	**41.5**
Tier 2 Supply:								
Eagle River	0.7	0	0	0.7	0	2.8	0	3.5
Powder Reserve	0	0	0	0	0	0	120.7	120.7
Chugiak with 770	6.3	0.0	0	6.3	56.2	0	0	62.5
Birchwood Airport	18.9	69.6	0	88.5	0	0	0	88.5
Eklutna Vicinity	35.5	13.8	0	49.3	0	0	10.9	60.2
Tier 2 Total	61.5	83.3	0	**144.7**	56.2	2.8	131.6	**335.3**
Tier 3 Supply:								
Eagle River	0.7	0	0	0.7	0	0	0	0.7
Powder Reserve	0	0	0	0	0	0	0.2	0.2
Chugiak with 770	0	0	0.1	0.1	0	0	0	0.1
Birchwood Airport	0.2	0	0	0.2	0	0	0	0.2
Eklutna Vicinity	0	0.2	0	0.2	0	0	0	0.2
Tier 3 Total	0.9	0.2	0.1	**1.2**	0	0	0.2	**1.4**
Total Supply:								
Eagle River	30.1	12.7	0	42.9	0	2.8	0	45.7
Powder Reserve	0	0	0	0	0	0	120.9	120.9
Chugiak with 770	6.3	0	0.1	6.4	56.3	0	0	62.6
Birchwood Airport	19.2	69.6	0	88.7	0	0	0	88.7
Eklutna Vicinity	35.5	13.9	0	49.4	0	0	10.9	60.4
Total Adjusted Supply	**91**	**96.2**	**0.1**	**187.4**	**56.3**	**2.8**	**131.8**	**378.2**

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Map 17. Net Supply of Buildable Land – Chugiak-Eagle River

Placeholder (map under development)

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Prohibitively Constrained Vacant Lands Deducted from the Net Supply

In both Anchorage and Chugiak-Eagle River, much of the gross supply of vacant lands was found to have prohibitive constraints to industrial development. The lands were therefore deducted from the net buildable land supply that is anticipated by this study to be available for industrial development within the 2035 planning horizon, based on current growth forecasts and policy trends.

The study area of the Industrial Land Assessment include some lands not currently zoned or designated for industrial use that would become available were there to be a significant change in growth trends or public policies. In such cases, changes in land use and transportation planning policies and public infrastructure investment priorities would need to take place if these lands were to become available for future industrial use within the planning horizon. Therefore, it is prudent that municipal policy decisions avoid assuming the following major landholdings are included in how much industrial supply is available.

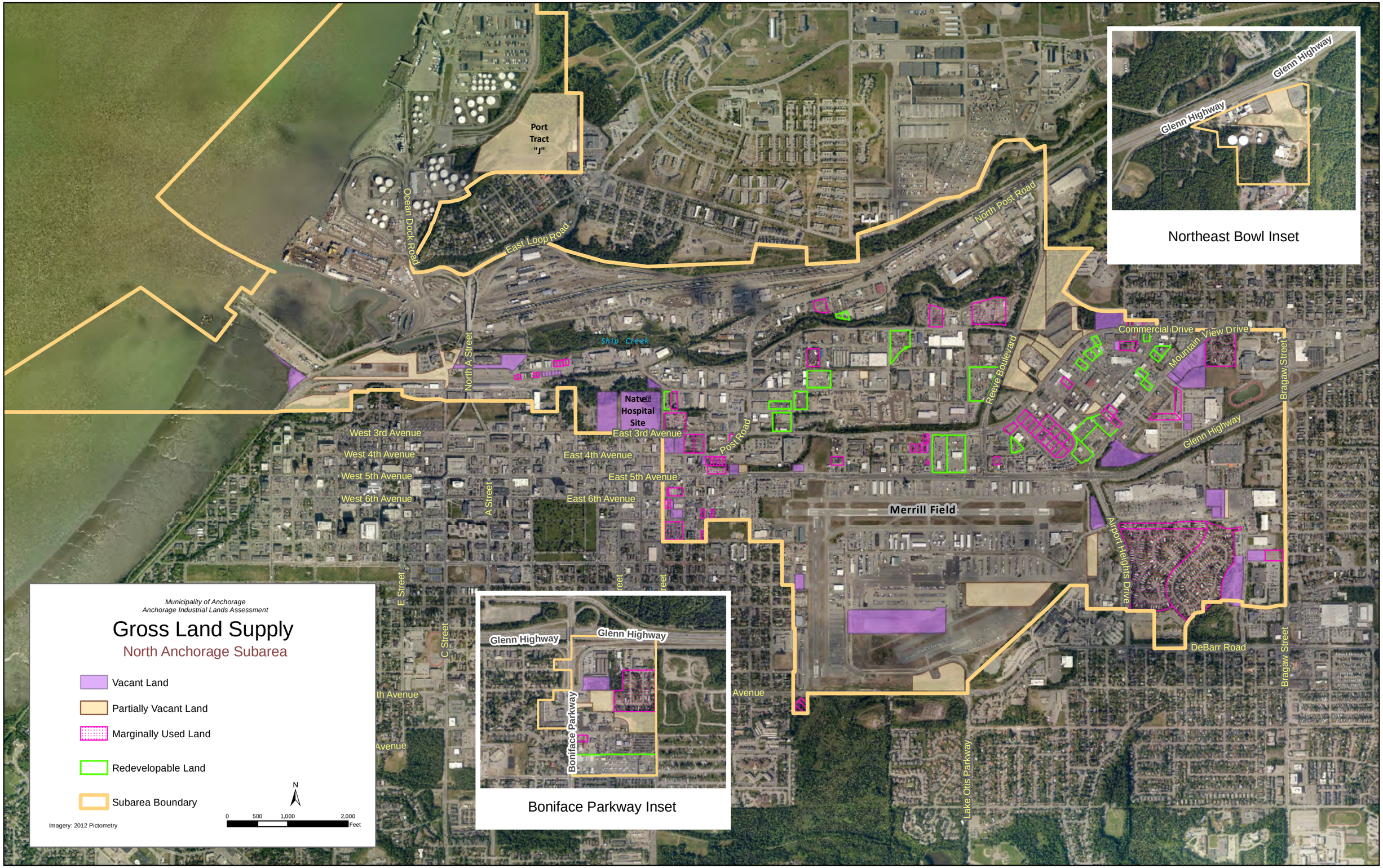
Table 29 on the next page identifies some of the major landholdings that are not anticipated to be available for industrial development within the planning horizon. A narrative describing the status of each of the major landholdings is provided later in this section, in the subarea land supply discussions.

Maps 18-25 document the gross supply of vacant, partially vacant, and marginally used lands identified by this Industrial Lands Inventory within the Industrial Land Assessment study area. Many of these lands that do not appear on the maps of net buildable land supply appear elsewhere in Section 5 due to prohibitive constraints. Section 3 describes the methodology of identifying prohibitive constraints used in this analysis.

Table 29. Major Landholdings Not Anticipated to Be Available under Current Trends by 2035

Parcels	Size in Acres	Prohibitive Constraints
Anchorage International Airport	818 (approx.)	Most of TSAIA is encumbered for future aviation use.
HLB Parcels west of Minnesota Drive south of Connors Lake Bog area		These are natural open space woodland and high value wetlands, and in conservation easements or to become part of a wetlands mitigation bank.
Laurel Acres Subdivision (small lots portion of plat)	91 (not including ROWs)	This is an unimproved "paper plat" comprised of undeveloped wetlands, with multiple property owners, and zoned R-1.
CIRI parcels and Municipal Park south of 100th, west of C Street, east of Minnesota Drive	54 (CIRI west), 69 (Park), and 20 (CIRI east)	The western CIRI parcel, zoned R-1, is most likely to be rezoned to commercial or multifamily use. The parkland is dedicated. CIRI intends to develop northwest corner of Minnesota Drive and C Street as commercial.
Fire Island	4,240	Road access is not considered likely within the 20-year planning horizon, given growth and policy trends.
Joint Base Elmendorf-Richardson (JBER)	73,000 (approx.)	All JBER lands are in sensitive locations or encumbered for operations or training needs.
Powder Reserve Tract C and part of Tract B	120 (Tract B) 770 (Tract C)	Not anticipated to be developed as industrial.
Eklutna 770 Tract	675 (approx.)	Most of the 770 is designated for residential. This study assumes an area somewhat larger than the currently proposed monofill area master plan will become available.
Mirror Lake reserve lands of Eklutna, Inc.	1,200 (approx.)	Highway Interchange access is not planned to occur by 2035, given population growth trends.

A discussion about the landholdings in Table 28 is included in the subarea discussions later in this section.


Port Tract "J"
Ocean Dock Road
East Loop Road
North Post Road
Ship Creek
North A Street
Native Hospital Site
West 3rd Avenue
West 4th Avenue
West 5th Avenue
West 6th Avenue
East 3rd Avenue
East 4th Avenue
East 5th Avenue
East 6th Avenue
Post Road
A Street
E Street
C Street
Reeve Boulevard
Commercial Drive
Mountain View Drive
Bragaw Street
Glenn Highway
Merrill Field
Airport Heights Drive
DeBarr Road
Lake Otis Parkway
Municipality of Anchorage
Anchorage Industrial Lands Assessment
Gross Land Supply
North Anchorage Subarea
Vacant Land
Partially Vacant Land
Marginally Used Land
Redevelopable Land
Subarea Boundary
Imagery: 2012 Pictometry
N
0 500 1,000 2,000 Feet
Northeast Bowl Inset
Boniface Parkway Inset

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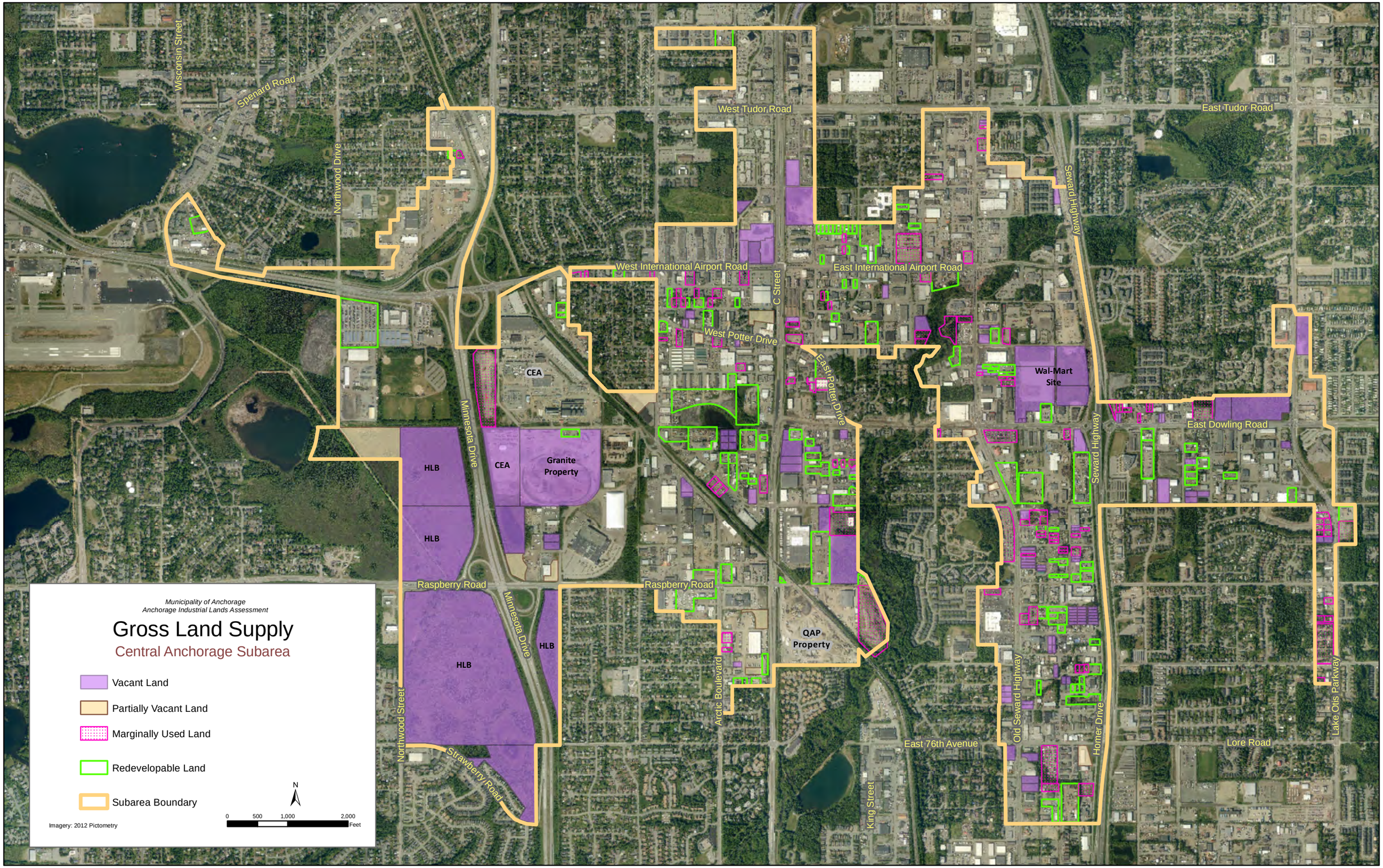
Wisconsin Street
Spenard Road
Northwood Drive
West Tudor Road
East Tudor Road
Seward Highway
West International Airport Road
East International Airport Road
C Street
West Potter Drive
East Potter Drive
CEA
Wal-Mart Site
East Dowling Road
Minnesota Drive
HLB
CEA
Granite Property
HLB
HLB
Raspberry Road
Raspberry Road
Minnesota Drive
HLB
HLB
QAP Property
Arctic Boulevard
Northwood Street
Strawberry Road
King Street
East 76th Avenue
Old Seward Highway
Homer Drive
Lore Road
Lake Otis Parkway
Municipality of Anchorage
Anchorage Industrial Lands Assessment
Gross Land Supply
Central Anchorage Subarea
Vacant Land
Partially Vacant Land
Marginally Used Land
Redevelopable Land
Subarea Boundary
Imagery: 2012 Pictometry
N
0
500
1,000
2,000
Feet

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Municipality of Anchorage
Anchorage Industrial Lands Assessment

Gross Land Supply

Anchorage International Airport Subarea

- Vacant Land
- Partially Vacant Land
- Marginally Used Land
- Redevelopable Land
- Subarea Boundary

N

0 500 1,000 2,000 Feet

Imagery: 2012 Pictometry

Point Woronzof Drive
Postmark Drive
West Northern Lights Boule
MOA
Wisconsi
Minnesota
Spenard Road
Northwood Drive
West International Airport Road
FCC Property
Kulis
Raspberry Road
Jewel Lake Road
Sand Lake Road
Northwood Street

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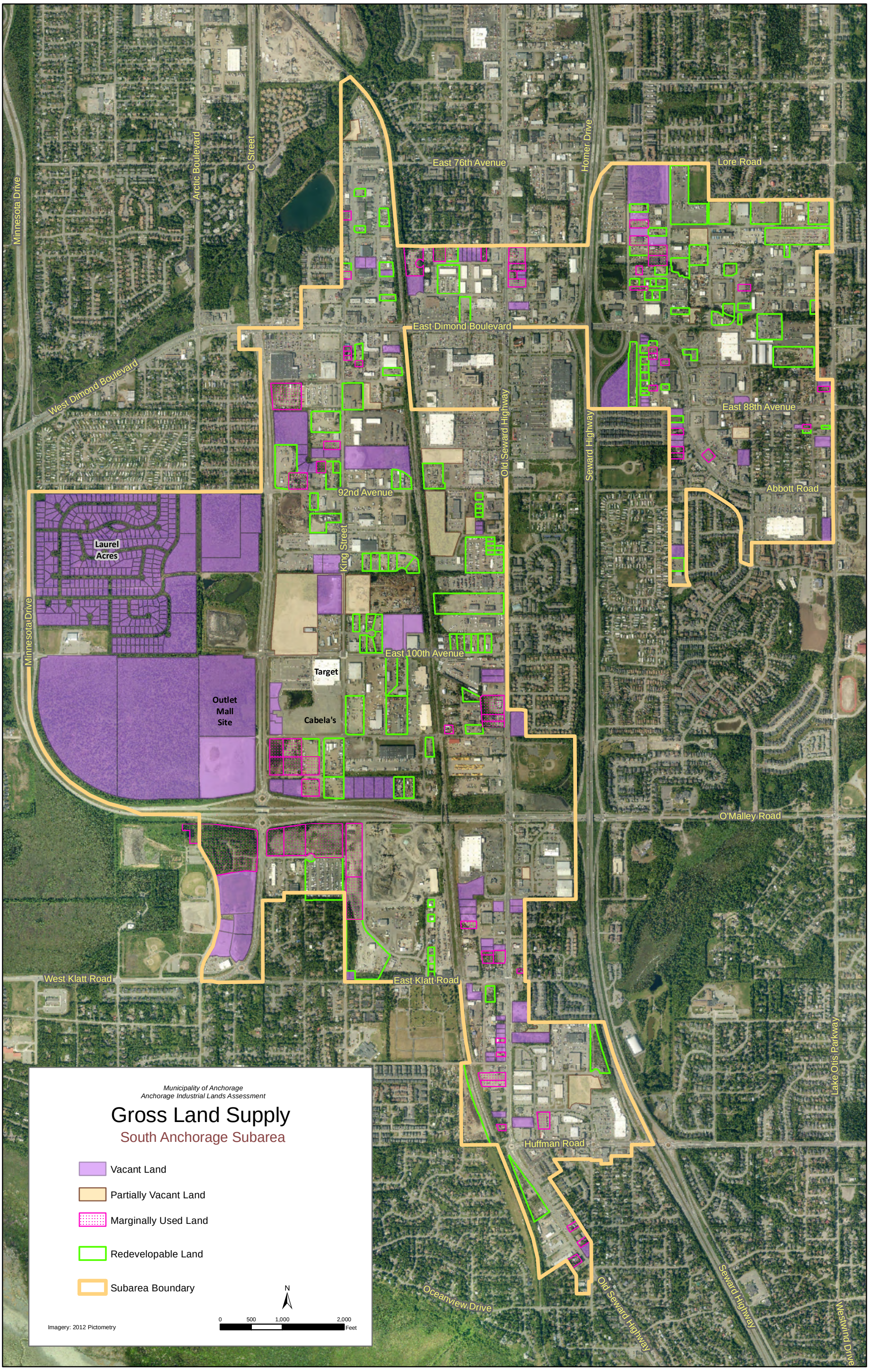
Minnesota Drive
Arctic Boulevard
C Street
East 76th Avenue
Homer Drive
Lore Road
East Dimond Boulevard
West Dimond Boulevard
Old Seward Highway
Seward Highway
East 88th Avenue
92nd Avenue
Abbott Road
Laurel Acres
King Street
Minnesota Drive
East 100th Avenue
Target
Outlet Mall Site
Cabela's
O'Malley Road
West Klatt Road
East Klatt Road
Lake Otis Parkway
Huffman Road
Oceanview Drive
Old Seward Highway
Seward Highway
Westwind Drive
Municipality of Anchorage
Anchorage Industrial Lands Assessment
Gross Land Supply
South Anchorage Subarea
Vacant Land
Partially Vacant Land
Marginally Used Land
Redevelopable Land
Subarea Boundary
N
0
500
1,000
2,000
Feet
Imagery: 2012 Pictometry

Map 21

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Municipality of Anchorage
Anchorage Industrial Lands Assessment

Gross Land Supply

Eagle River and Powder Reserve Subareas

Subarea Boundary

Vacant Land

Underutilized Land

Redevelopable Land

N

0 0.5 1 Miles

Imagery: 2012 Pictometry and 2010 Orthophoto

South Birchwood Loop Road

Old Glenn Highway

Business Boulevard

North Eagle River Loop Road

Eagle River Road

Driftwood Bay Drive

East Eagle River Loop Road

Hiland Road

Glenn Highway Glenn Highway

Stewart Mountain Drive

Map 22

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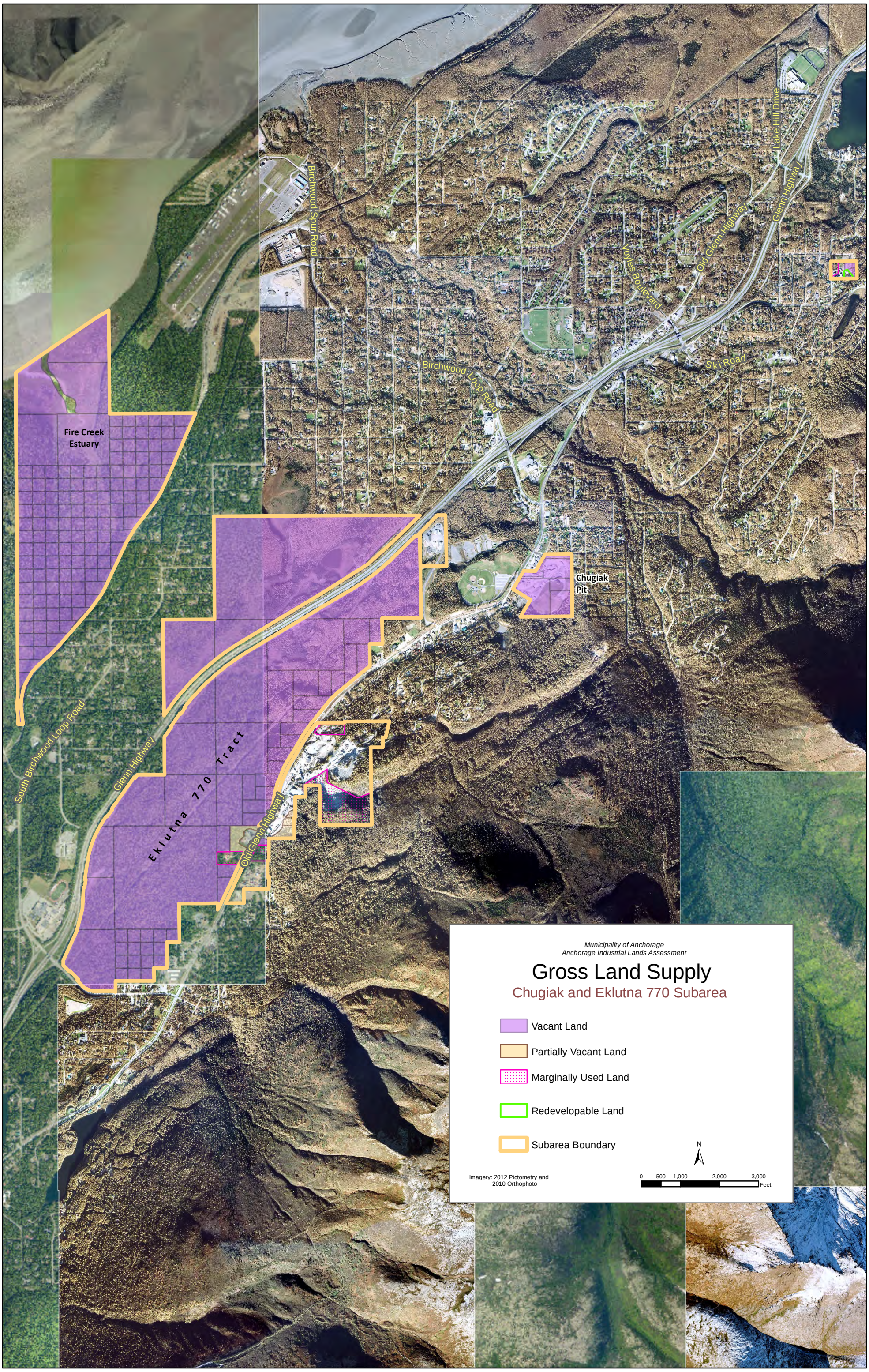
Birchwood Spur Road
Lake Hill Drive
Glenn Highway
Voyles Boulevard
Old Glenn Highway
Ski Road
Birchwood Loop Road
Fire Creek
Estuary
Chugiak
Pit
South Birchwood Loop Road
Glenn Highway
Eklutna 770 Tract
Old Glenn Highway
Municipality of Anchorage
Anchorage Industrial Lands Assessment
Gross Land Supply
Chugiak and Eklutna 770 Subarea
Vacant Land
Partially Vacant Land
Marginally Used Land
Redevelopable Land
Subarea Boundary
N
0 500 1,000 2,000 3,000
Feet
Imagery: 2012 Pictometry and
2010 Orthophoto

Map 23

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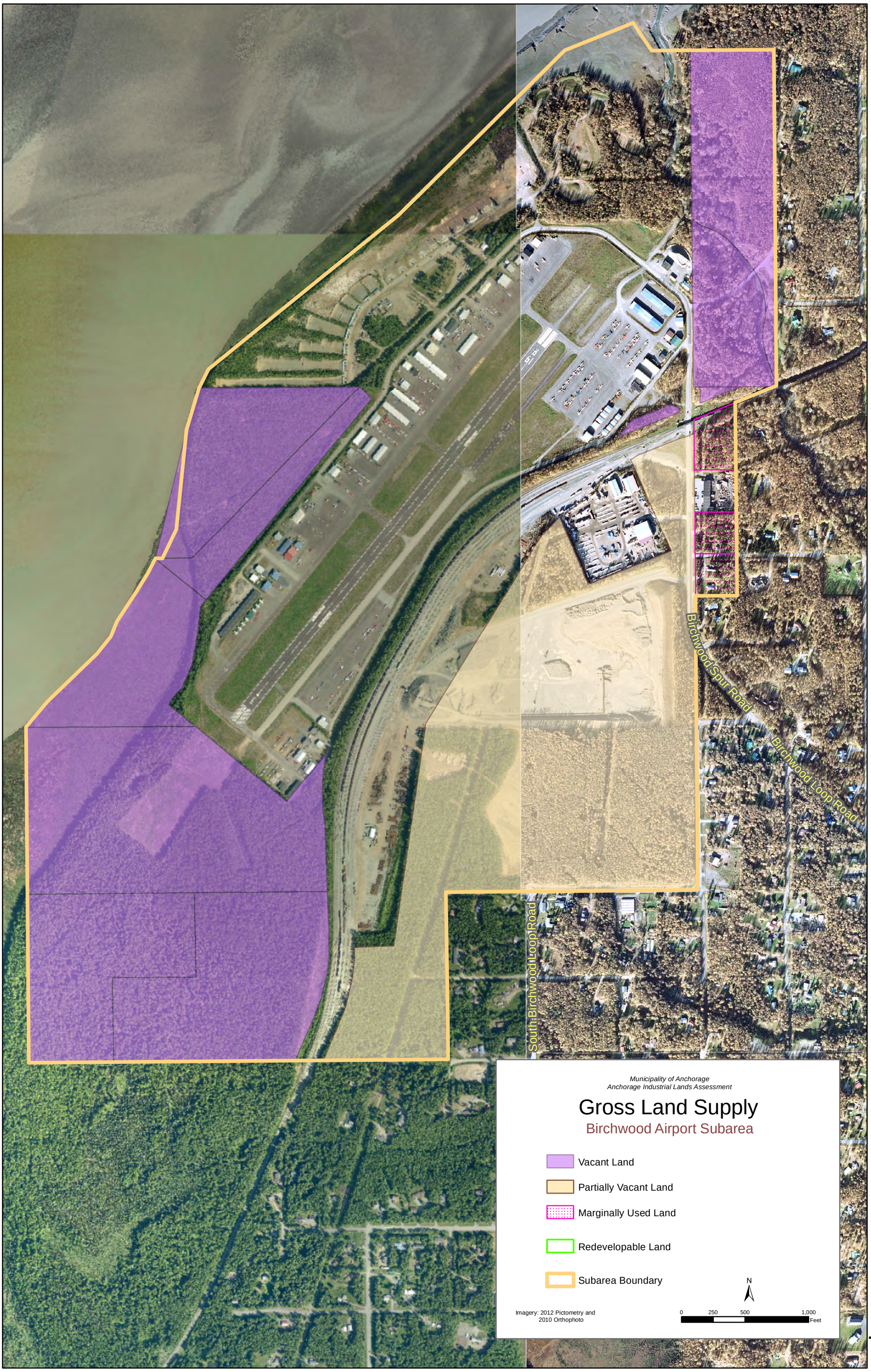
Birchwood Spur Road
Birchwood Loop Road
South Birchwood Loop Road
Municipality of Anchorage
Anchorage Industrial Lands Assessment
Gross Land Supply
Birchwood Airport Subarea
Vacant Land
Partially Vacant Land
Marginally Used Land
Redevelopable Land
Subarea Boundary
N
Imagery: 2012 Pictometry and 2010 Orthophoto
0 250 500 1,000
Feet

Map 24

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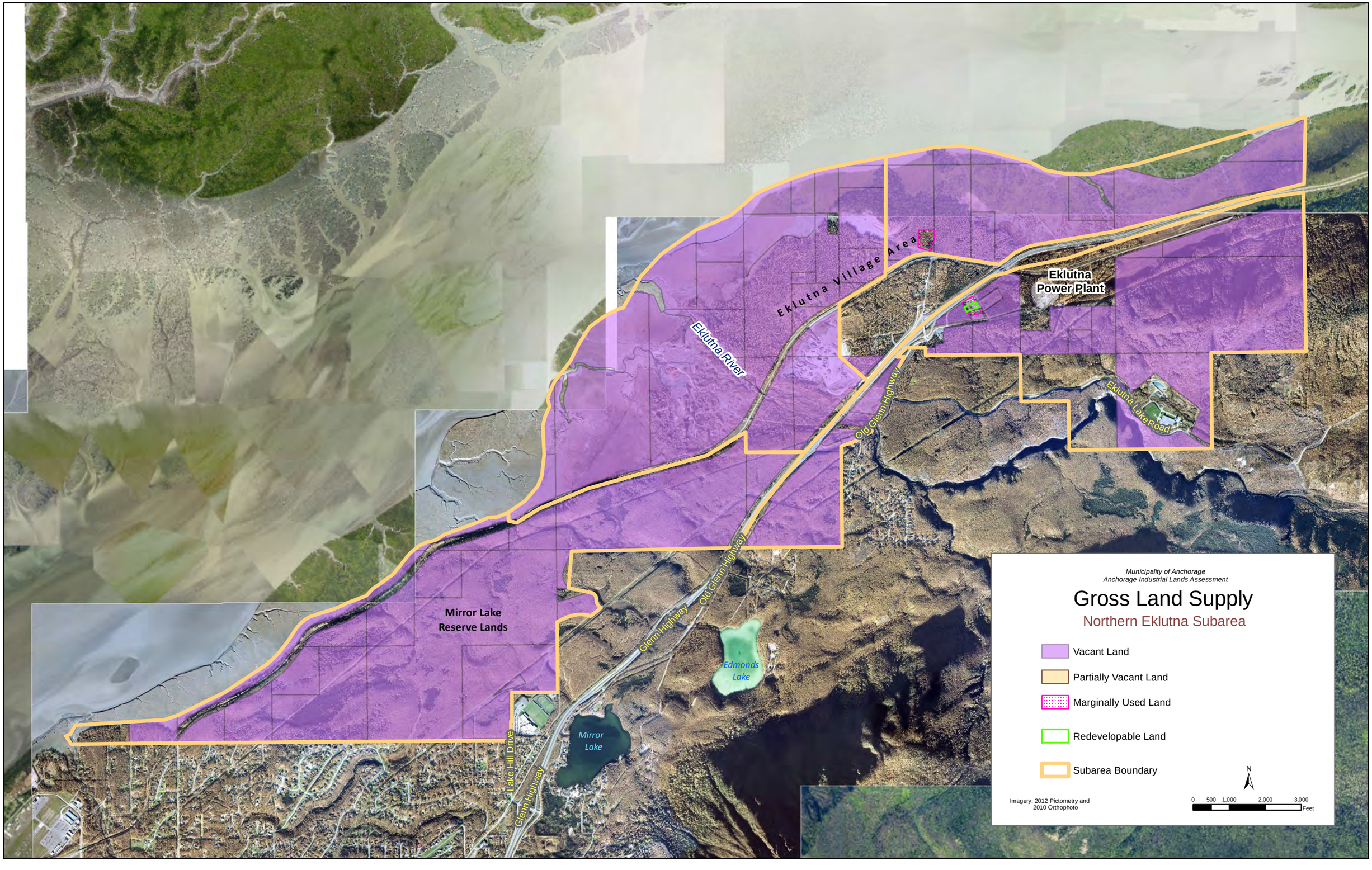
Eklutna Village Area
Eklutna River
Eklutna Power Plant
Old Glenn Highway
Eklutna Lake Road
Mirror Lake Reserve Lands
Glenn Highway
Old Glenn Highway
Edmonds Lake
Mirror Lake
Lake Hill Drive
Glenn Highway
Municipality of Anchorage
Anchorage Industrial Lands Assessment
Gross Land Supply
Northern Eklutna Subarea
Vacant Land
Partially Vacant Land
Marginally Used Land
Redevelopable Land
Subarea Boundary
N
Imagery: 2012 Pictometry and 2010 Orthophoto
0 500 1,000 2,000 3,000
Feet

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CHARACTERIZATION OF BUILDABLE LAND SUPPLY BY SUBAREA

North Anchorage Subarea

Net buildable, available supply of Tier 1 industrial-zoned land: 27 acres

Additional supply in PLI and T zoned lands: 87.9 acres

North Anchorage has a net buildable supply of 27 acres of Tier 1 and 41.7 acres *total* of Tier 1, 2 and 3 industrially zoned land, when factoring partial and significant site constraints and commercial utilization rate on industrial land in the Bowl. The total amount of net buildable land supply available for future industrial development, when including non-industrial-zoned lands, is 122.3 acres.

This subarea includes Anchorage's oldest industrial district, and is almost completely developed. No vacant parcels remain in the Ship Creek basin industrial district. Developable acreage in the North Anchorage Subarea is characterized by scattered small lots up to an acre or two in size, currently occupied by marginal uses. Map 26 depicts the net buildable land supply in North Anchorage.

Several medium-size vacant or partially vacant parcels under Railroad and HLB ownership are located near Reeve Boulevard and Viking Drive on Railroad lands.

An I-1 industrial enclave east of Boniface Parkway near the Glenn Highway provides a medium-size cluster of partially vacant, marginally used, and vacant lots in the North Anchorage subarea. Several vacant parcels in this area are currently zoned B-3, R-3, and R-4, and are not included in the estimate of existing industrial land supply, although there is speculation about potential conversion to industrial uses, and interest on the part of several property owners in rezoning to I-1.

Anticipated losses of both vacant and utilized I-1 and I-2 lands to planned highway projects, potential expansion of Railroad operations north of East Post Road, and Merrill Field Airport expansion in the Orca Street vicinity may cancel out the net buildable land supply in North Anchorage. If constructed as planned in the *Metropolitan Transportation Plan* (*MTP*), the Seward Highway to Glenn Highway Connection (H2H) project could remove more than 10 acres of I-1 and 20 acres of I-2 (as well as more than 10 acres of B-3) zoned land from the Ship Creek and Commercial Drive industrial areas. Loss of usable land base through attrition by highway projects in central city areas was a common feature in postwar era metropolitan areas, and may be experienced by Anchorage in the future.

During the latter stages of the industrial study, a worksession participant from the Anchorage Assembly requested a review of the adopted plans for Downtown (2007) and Ship Creek (2014) to determine if the recommendations in these plans would lead to further loss of industrial land. These plans emphasize

mixed-use residential and commercial redevelopment in the western Ship Creek area. A review found that the plans do in fact recommend converting some existing lots currently in active industrial use to non-industrial redevelopment sites. While here is no direct impact on the vacant land supply, this study's projection of anticipated future loss of industrial lands could have been increased by approximately 10 acres over what is depicted in Tables 25 and 26.

Most federal, state and municipal lands in North Anchorage Subarea (besides the Railroad Terminal Reserve lease lots) are committed to public facility use—such as the ML&P power generation plant campus east of Centennial Park, Port of Anchorage Tract J (discussed in the JBER section that follows), or at Merrill Field Airport. Most of these lands are not available other than for transportation facilities or utilities. However, there are three tracts of public land which this study includes in the estimate of land supply acreage for North Anchorage. These are the former Native Hospital site, the Railroad/HLB lands east of Reeve Boulevard, and a large JBER tract northeast of the Boniface Parkway and Glenn Highway intersection. A description of each follows:

- The former site of the Alaska Native Hospital is now municipal HLB land, zoned PLI, and comprises 5.7 acres of net buildable supply, after factoring constraints, such as steep slopes and seismically induced ground failure hazards. However, these lands could be useful as construction lay-down yards, or materials and equipment staging areas. Longer-term, more intensive use may be precluded by planned highway improvements related to the Knik Arm Crossing (KAC) and H2H connection road projects.

- Although partially constrained by slopes and wetlands, there is a relatively large vacant and underutilized land base between Reeve Boulevard and Commercial Drive. It consists of lowlands accessible to Reeve across from Viking Drive, and uplands accessible to Commercial Drive. The lowlands along Reeve adjoin the former Eagleglen Golf Course (now Eagleglen Fitness Park) to the north, which is discussed in the following pages as one of five JBER study sites as part of the industrial lands inventory.

- However, it is another JBER property, zoned T (Transition) and occupying the northeast quadrant of the Boniface Parkway and Glenn Highway intersection, which appears most likely to contribute to the net buildable land supply. The JBER Boniface site is subject to a three-party land conveyance agreement in progress between the Municipality, JBER, and Eklutna, Inc. In the event of a land exchange, an estimated 77 acres of net buildable land supply would transfer to Eklutna, Inc. JBER is considered likely to place covenants restricting future uses to primarily light industrial. It would be the largest contiguous area of undeveloped, buildable industrial land in the Bowl. For this reason, the 77 acres of the JBER Boniface property are included in the North Anchorage Subarea acreages. A discussion and map of the Boniface site are provided in the JBER narrative section below.

Municipality of Anchorage
Anchorage Industrial Lands Assessment

Net Supply of Buildable Industrial Land

North Anchorage Subarea

- Unconstrained Land
- Partially Constrained Land
- Significantly Constrained Land

- Redevelopable land where site FAR < 0.10 and BLVR < 0.75
- Parcels 1 acre or larger in size
- Lands partially or significantly constrained only due to no water and/or wastewater service.

- Subarea Boundary
- Zoning Boundary

N

0 500 1,000 2,000 Feet

Imagery: 2012 Pictometry

Northeast Bowl Inset

Boniface Parkway Inset

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Alaska Railroad Operations in the Ship Creek Terminal Reserve

The overall land use pattern for the Alaska Railroad operations areas within Ship Creek is expected to continue with moderate expansion of operational activities in the Port and East Post Road areas during the Planning horizon.

Much of the Ship Creek industrial district is part of the Alaska Railroad Ship Creek Terminal Reserve, which consists of about 600 acres. The Alaska Railroad leases much of its Terminal Reserve lands to primarily industrial users.

Although the Railroad's industrial lease lots include many older buildings that could be renovated or replaced, redevelopment opportunities have historically been constrained because the land could only be leased. The availability of longer lease terms (i.e., 99 years) could improve the potential for infill and redevelopment at higher intensities to reflect the strategic advantages of this area near rail and port operations.

The Railroad still uses the majority of its industrial-zoned lands for railroad operations. Any future expansion, reduction, or relocation of Railroad operation areas would therefore affect the amount of acreage in Anchorage's industrial land supply. However, consultation with the Alaska Railroad indicates that operational areas available within its Ship Creek Terminal Reserve lands are less than optimal for current Railroad operations. As a result, the Railroad indicates that it is unlikely to lease more of its designated operational areas to non-railroad industrial uses.

Removal of the Alaska Railroad operations from the Ship Creek Terminal Reserve to another location in the Municipality, in Whittier, or in the Mat-Su Borough is not anticipated within the planning time horizon. The Railroad explained that, although the Ship Creek Terminal Reserve is constrained in area, it remains most advantageous for the Railroad and associated distributors and warehousing to co-locate with the Port of Anchorage near major markets and transportation. The proposed Knik Arm Crossing would not include a railroad line, and Railroad lands in Eagle River (i.e., Powder Reserve Tract C) and Birchwood Industrial Park supplementary laydown yard areas are considered too remote.

The Alaska Railroad has several options to alleviate pressure within its terminal operations areas. It intends to build a second railroad track in the north area of the Port of Anchorage within five to 10 years. This would enable moving cargo directly from ships to rail, avoiding the "drayage" costs of trucking cargo to rail cars. Single handling at the Port between ship and rail is likely to cut the cost of transportation by rail. This investment would also relieve some pressure from existing railroad operations and other Terminal Reserve lands.

Further operational area expansion may occur at the east end of the Ship Creek industrial basin. Terminal Reserve lease lands on the north side of East Post Road are anticipated to be reserved for future Railroad operational needs. This consists of a relatively narrow strip of lease lots currently in non-railroad industrial use. A realignment of Post Road, to shift it somewhat north, is also

possible, and would encroach into these existing lease lots on the north side of Post Road.

Expansion of industrial or Railroad operations west into the Ship Creek PC (Planned Community) Zoning District lands appears unlikely, based on consultations with the Alaska Railroad and the Municipality's recently adopted *Ship Creek Framework Plan*. The PC zoned area is expected to remain designated for commercial/mixed-use related to Downtown. The *Ship Creek Framework Plan* (adopted by the Municipality in 2014) also covers the boat launch area currently zoned MC (Marine Commercial).

Market demand and improvements in sewer service are, however, likely to increase the potential for more intensive industrial use of existing industrial lease lot areas. The Railroad plans to extend wastewater service east to Viking Drive within five to ten years, which will increase the capacity of the area to accommodate industrial users.

The Railroad considers the Terminal Reserve to be well positioned relative to other industrial areas in the Municipality for users that transport goods north from Anchorage. Distribution, warehousing, intermodal shipping container management, and recycling are among the growing uses found in Ship Creek.

Port of Anchorage

Lands owned by the Port of Anchorage are anticipated to remain available only for Port and Railroad related transportation operations. The Port's modernization project no longer appears likely to result in land reclamation or additional space on pilings as a means of increasing the operational land supply in Anchorage within the planning horizon. The Port has redirected its priorities toward modernization to extend the life of its existing operating area. For the purposes of the industrial land study the Port is not expected to contribute additional acreage to the industrial land supply.

Merrill Field Airport

The municipal-owned Merrill Field Airport is zoned I-1 and comprises more than 320 acres of land, some of which is not currently in use. However, consultation with Merrill Field staff indicates only two small parcels on these Airport lands are identified as likely to become available for additional non-aviation industrial or commercial development. Moreover, the Airport plans to expand aviation operations and non-industrial uses into lands currently used for industrial and snow storage activities. Therefore, this study anticipates a net loss of the industrial land base in and around Merrill Field Airport.

Merrill Field intends to ensure adequate lease areas are available to satisfy projected increased demand by aviation uses, subject to Federal Aviation Administration (FAA) regulations prioritizing the national aviation transportation system. Therefore, nearly all of the remaining developable lands within Merrill Field Airport are reserved for aviation uses, airfield and air traffic control improvements, and airport buffer zones to protect against incompatible

uses. The *Merrill Field Airport Master Plan and Noise Study Update* identifies a potential helicopter training area, tie-down space, and an expanded campground for pilots and aviation passengers. There is demand for additional hangar space than is currently available at Merrill Field. Two additional hangars are in planning stages to be built on vacant, formerly industrial property located on the east side of Orca Street next to the Fairview neighborhood.

The area north of the Municipal Fire Training Center on Airport Heights Drive is underutilized; however, it is questionable if this site is available for long-term lease for non-aviation uses. One scenario considered in the *Airport Master Plan Update* process includes the possibility of Airport acquisition of lands east of the Airport, to Airport Heights Drive, for a commercial and/or residential airpark.

Development at the south end of the Airport, next to 15th Avenue, is significantly constrained as it is on the southern edge of the former city landfill that underlies most of the Airport. Merrill Field has an on-going program of improving the development potential in existing developed aviation use areas through a process of "dynamic compaction" of the fill underlying the airport to make the former landfill areas more buildable, or at least make it more stable for paved surfaces. The process delays subsidence for at least 12 to 15 years, based on 10 to 12 feet of compaction, making Airport lands more suitable for longer term improvements and structures. However, improvement costs will remain above normal and the lifespan of structures shorter than comparable improvements elsewhere in town.

The Merrill Field Airport Master Plan directs expansion of the Airport along the east side of Orca Street for aviation use. Two parcel areas currently in industrial use, occupied by Potelcom (wholesale supply) and City Electric (contracting), both generally located east of Orca Street and north of 8th Avenue, are anticipated to be converted to an aviation use such as hangar space within the planning horizon.

Long-term leases for non-aviation uses are required to be at fair market value, and the FAA is moving Merrill Field toward redeveloping its existing leased lands toward a higher income-generating PLI use rather than snow storage and park. A U-Med type of health services use on Tract V (its easternmost tract on the south side of 15th Avenue) would relate to Alaska Regional Hospital, for example. This change in use would eliminate an existing municipal snow disposal site in favor of more commercial/institutional development.

Two parcels within Airport lands may, depending on FAA approval, become available for long-term leases to non-aviation industrial or commercial uses. These parcels are not affected by fill conditions and include:

1. A limited area on the west side of the runway protection zone (RPZ) north of 5th Avenue could be available for a small commercial (non-industrial) use, such as a coffee stand; and

2. A parcel at the east end of the E-W runway could be available for a long-term lease. The site is limited in size and is noisy. However, it has good access along Airport Heights Drive and topography separates it from the runway areas.

At the time of this writing, the future status of the Anchorage Fire Department facilities on Airport Height Road was undetermined.

Merrill Field Airport management does not currently forecast a need for expansion of Aviation uses or supporting industrial uses east of Airport Heights Road in the Northway Mall/Penland Parkway area. Compatible commercial uses in this area such as hotels and commercial services would be adequate and appropriate for Airport support.

Central Anchorage Subarea

Net buildable, available supply of Tier 1 industrial-zoned land: 68.5 acres

Additional supply in PLI lands: 6.9 acres

Central Anchorage subarea has a net buildable supply of 105.8 acres of industrially zoned land including Tiers 1, 2, and 3, when factoring partial and significant site constraints and commercial utilization rate on industrial land in the Bowl. The total amount of land supply available for future industrial development, including non-industrial-zoned lands, is 112.7 acres.

Map 27 depicts the net buildable land supply in Central Anchorage.

Table 25 indicates there is 17.5 acres of Tier 3 I-1 zoned land in Central. Most of this consists of small lots of less than a half acre in size scattered around the subarea, more than in all other subareas combined. Lots this small are not optimal for most businesses; however, they can provide space for smaller enterprises or supplementary space for businesses outgrowing their primary locations.

More than two-thirds of the buildable land supply in Central Anchorage is zoned I-1. However, approximately 40 percent of the I-1 land supply in Central consists of a single undeveloped site owned by Wal-Mart Corporation. The lot is approximately 35 acres and located south of the municipal Solid Waste Central Transfer Station between the Old and New Seward Highways. At the time of this report Wal-Mart's plans for the site were not known. Wal-Mart received site plan approval for a large retail establishment in 2005; however, no store was built and Wal-Mart instead remodeled its existing stores in Midtown and at Dimond Center.

Municipality of Anchorage
Anchorage Industrial Lands Assessment

Net Supply of Buildable Industrial Land

Central Anchorage Subarea

- Unconstrained Land
- Partially Constrained Land
- Significantly Constrained Land

- Redevelopable land where site FAR < 0.10 and BLVR < 0.75
- Parcels 1 acre or larger in size
- Lands partially or significantly constrained only due to no water and/or wastewater service.

- Subarea Boundary
- Zoning Boundary

Imagery: 2012 Pictometry

N

0 500 1,000 2,000 Feet

Postmark Drive
Wisconsin Street
Spenard Road
Northwood Drive
Minnesota Drive
West Tudor Road
East Tudor Road
Seward Highway
West International Airport Road
East International Airport Road
C Street
West Potter Drive
East Potter Drive
Chugach Electric Association (CEA)
American Steel
Granite Property
Centerpoint Church
Carr-Gottstein Warehouse
Wal-Mart Site
East Dowling Road
Raspberry Road
HLB Parcel #5-002-B
QAP Property
Arctic Boulevard
Strawberry Road
King Street
East 76th Avenue
Old Seward Highway
Homer Drive
Lore Road
Lake Otis Parkway
West Dimond Boulevard
East Dimond Boulevard
Abbott Road

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Another of the larger I-1 sites in question is a 6.9-acre I-1 zoned property located on C Street between three hotels to the south and restaurants and another hotel to the north. The established land use pattern surrounding it is commercial. The site is being prepared for development.

The remainder of the I-1 zoned land supply, comprising more than a third of the buildable industrial lands in the Central subarea, consists of small-l to medium-size vacant and marginally used parcels scattered in the various industrial areas of Central Anchorage. Several medium-size clusters of vacant or marginally used parcels exist in the general vicinity of the Carr-Gottstein Food Distribution Warehouse, east of C Street near 64th Avenue.

Most of the remaining one-third of the buildable land base is zoned I-2. Almost all of this I-2 buildable acreage consists of a 37-acre site formerly owned by Granite Construction, located south of Electron Drive and north of the CenterPoint Church/cold storage warehouse on Raspberry Road. The former Granite property is being replatted into a subdivision of eight industrial parcels. The primary constraint to development of the property has been a lack of wastewater service. A sewer line will need to be extended from Raspberry Road to the south. This inventory anticipates that wastewater service will most likely be achieved within the planning horizon thereby avoiding significant constraints to the property's development potential.

The second large I-2 property is approximately 10 acres and located at the deadend of Raspberry Road extending east from C Street, next to the Campbell Creek Greenbelt. Its current use observed during the field inventory is dirt and gravel material storage. The inert nature of observed use led the field inventory team to place this lot in the "marginally used" category and include it as part of the land supply estimate.

The Central subarea has a limited amount of acreage of public land that could be available for non-utility industrial use. This includes a 6.7-acre HLB tract zoned PLI and partially constrained by wet soils, located on the east side of Minnesota Drive and south of Raspberry Road. The much larger HLB tracts on the west side of Minnesota Drive are considered committed to natural open space use, based on consultation with HLB. (More specific discussion of all HLB lots within the Anchorage Bowl is provided below, following the discussion of the South Anchorage subarea.)

Chugach Electric Association (CEA) Lands in Central

The Chugach Electric Association (CEA) has invested in a new electrical power generation plant and headquarters building at its Electron Drive campus. The Electron Drive campus still includes several extensive CEA parcels not fully utilized. Consultation with CEA indicates that all of its lands in the Electron Drive campus are reserved for future utility use. These include a parcel located along Minnesota Drive west of the main power generation plant, which is used as a laydown yard for CEA projects, and a larger reserve parcel located to the south. CEA may use a portion of these lands for a pilot project to install a flywheel battery energy storage system as a means of regulating variable wind resource inputs into the power grid.

CEA is exploring the potential for a waste-to-energy plant in another part of the Central Anchorage subarea. Such a plant may generate up to 20 megawatts of electricity and require 20 to 25 acres of land. For transportation reasons CEA believes that the optimal location for such a plant would be next to the municipal Central Transfer Station rather than on the CEA Electron Drive campus. This scenario remains in concept only. If plans solidify, the industrial lands inventory should be adjusted to remove an additional 20 to 25 acres from the estimate of net buildable land supply available for non-utility industrial uses.

International Airport Subarea

Net buildable, available supply of Airport land: 77.5 acres

The largest subarea of the Anchorage Bowl consists primarily of the Ted Stevens Anchorage International Airport (TSAIA) property. It also includes the AWWU Asplund Wastewater Treatment facility and municipal park and HLB lands west of the Airport. However, these municipal lands are not considered as potential industrial sites, other than continuation and potential expansion of the AWWU utility function, and any Airport operations expansion that may occur from a potential future land exchange between TSAIA and the Municipality.

This Subarea has a net buildable supply of 77.5 acres of Tier 2 land, when factoring partial and significant site constraints and commercial utilization rate on industrial land in the Bowl. Although parcels are large in size and mostly uplands, all of this potential supply is located on TSAIA property, zoned variously as I-1, PLI, and T; and may be subject to constraints on industrial uses.

Ted Stevens Anchorage International Airport

The state-owned TSAIA property includes 4,733 acres. TSAIA provides primary passenger and cargo service to the region, serves as the primary means of transportation for many rural Alaska communities, and is a worldwide air cargo refueling and distribution point. The Airport has recently grown in area with the transfer of the former Kulis Air National Guard Base (2011) and the former Federal Communications Commission (FCC) property (2014) along Raspberry Road near South Airpark.

Parcels within Airport properties which are fully or partially in use account for approximately 2,700 to 2,800 acres of Airport land. Most of the remainder, other than areas in parks and recreational trail use under temporary use permit, is undeveloped, and is not currently in use. This includes significant land holdings west of the N-S runway (West Airpark), in the vicinity of Postmark Drive (North Airpark), and south of the E-W runway (South Airpark) including the aforementioned FCC and Kulis ANG acquisitions.

For reasons discussed below, the Industrial Land Assessment identified only four tracts of developable or reusable Airport land, which may be available for future non-aviation industrial use. However, the tracts are relatively large, as compared to the average vacant parcel size in other subareas of the Bowl. Map 28 shows these developable tracts, which are located along Raspberry Road and east of Jewel Lake Road along the south side of International Airport Road. A fifth tract, comprising the south portion of the Airport's recent FCC land acquisition, was also identified by the Airport and is discussed below.

The Airport is subject to Federal Aviation Administration (FAA) regulations that restrict non-aeronautical use of airport land, including most industrial uses. When airports accept land or funding from the federal government, they agree to certain assurances in return. This policy is intended to make sure that federal resources are used for their intended purpose of enhancing the national aviation system. TSAIA has accepted both land and funding and, therefore, is subject to FAA grant assurances. Grant assurances apply to the entire Airport property, not just the parts acquired with federal resources.

The Airport can permit non-aeronautical uses on a short-term, interim basis, provided the area is not needed for immediate airport development and the use is compatible with airport operations. The length of the lease period depends on when the Airport may need the land. The typical maximum lease of airport land for non-aeronautical use is five years although some parcels designated non-aeronautical use on the Airport Master Plan will likely be available for up to 35 years. Lease rates for non-aeronautical uses must be based on fair market value. By contrast, aviation uses receive a discounted lease rate and a longer (35-year) lease term.

Nearly all industrial sectors besides airport transportation operations would be classified as a non-aeronautical use, and are therefore subject to the limitations above. For example, non-aeronautical uses as classified by the FAA include: freight forwarding companies; administrative offices of airline corporations; the U.S. Postal Service Office at Postmark Drive; and seafood cold storage warehousing and fish processing facilities for handling and consolidation of seafood products transported by air. Most industrial or transportation users besides the operation of aircraft or direct support to the operation of aircraft is likely to be considered non-aeronautical related.

Parts of TSAIA that have existing runway access will remain reserved exclusively for aeronautical related use. These include the West Airport area on the west side of the existing N-S runway, the South Airpark area comprising

most of the lands north of Raspberry Road, and the North Airpark area in the vicinity of Postmark Drive. The five-year limitation on non-aeronautical land leases makes these areas unlikely candidates for non-aeronautical industrial uses, because leasing on a five-year basis is inadequate for most industrial businesses to invest in vertical improvements on the land. If vertical improvements cannot be sold to the next (lessee) user, the improvements are required by Airport regulations to be torn down by the lessee.

However, some of the Airport property not currently in use and which does not have direct runway access is considered likely to be available for long-term leases for non-aeronautical use. For example, TSAIA has recently been able to offer 35-year leases in parts of the former Kulis Air National Guard Base, because the FAA has agreed to let Kulis be designated as an interim non-aeronautical use area. TSAIA achieved this by demonstrating to the FAA that the former Kulis ANG lands would not be needed for aviation uses for the foreseeable planning horizon. The State of Alaska is working with the FAA to designate approximately 68 acres of the 129 acres. Approximately 193,000 square feet of existing building space is available for lease. This includes four office buildings in the uplands located away from the aircraft parking aprons and three hangars adjacent to the apron.

TSAIA is working to designate additional Airport lands to allow longer-term leases for non-aviation uses as part of its *Airport Master Plan* (AMP) Update (December 2014). The AMP identifies and plans for airport growth needed to meet forecasted aviation demand. The FAA requires an AMP to include an "Airport Layout Plan" (ALP) set of drawings, which includes an airport land use plan map and development phasing plan. Most of the AMP Update was finalized as of March 2015; however, the Airport Layout Plan was still only available in draft form. Subject to FAA approval, the draft ALP designates several areas in the draft airport layout plan to allow long-term non-aviation uses on 35-year leases. Those areas include the following:

1. The southern half of the former Kulis Air National Guard Base, comprising approximately 68 acres, as discussed above;

2. The Airport tract located east of Jewel Lake Road along the south side of International Airport Drive, comprising approximately 37 acres; and

3. The three Airport tracts located on the south side of Raspberry Road, including: the south part of the recently acquired FCC property (39 acres); the undeveloped portion of the National Oceanic and Atmospheric Administration (NOAA) facility site located on the southwest corner of Sand Lake Road and Raspberry Road (18 acres); and the vacant tract on the southeast corner of Sand Lake Road and Raspberry Road (29 acres).

Municipality of Anchorage
Anchorage Industrial Lands Assessment

Net Supply of Buildable Industrial Land

Anchorage International Airport Subarea

- Unconstrained Land
- Partially Constrained Land
- Significantly Constrained Land
- Redevelopable land where site FAR < 0.10 and BLVR < 0.75
- Parcels 1 acre or larger in size
- Lands partially or significantly constrained only due to no water and/or wastewater service.
- Subarea Boundary
- Zoning Boundary

N

0 500 1,000 2,000 Feet

Imagery: 2012 Pictometry

Point Woronzof Drive
Postmark Drive
West Northern Lights Boulevard
North Airpark
West Airpark
East Airpark
West International Airport Road
West Tudor Road
Northwood Drive
Jewel Lake Road
Sand Lake Road
Raspberry Road
South Airpark
FCC Site
South FCC Site
Kulis Site
NOAA Facility

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In addition, a non-aeronautical use area is designated for the existing industrial parcels of East Airpark, located along the south side of International Airport Road west of the Airport Terminal. However, this analysis has determined that it would not be prudent to count on East Airpark contributing additional industrial land supply. Because East Airpark is in existing use, it is assumed to be unlikely to redevelop at substantially higher than existing intensities within the planning horizon.

The three areas discussed above may provide only a partial opportunity for industrial uses, for several reasons. First, even areas without direct runway access and which are designated to allow non-aeronautical use leases still allow and prioritize aeronautical users. There are aeronautical uses that can (and do) locate in areas that do not have runway access. Aviation uses have priority on TSAIA lands. However, TSAIA representatives to the Industrial Land Assessment Advisory Committee have explained that non-aeronautical use areas on Airport property are most likely to be available for long-term commercial or industrial lease.

Second, the Airport is obligated to consider all applications to lease airport land, and is required under federal grant assurances to lease to the highest income generating use compatible with Airport operations. Because commercial uses can command a higher rent, there is no guarantee that lands available for long-term leases for non-aviation uses would be leased to an industrial (PDR) use as opposed to a commercial (non-PDR) use.

Third, most of these tracts are currently zoned PLI (Public Lands and Institutions). Typically, the range of potential industrial uses in a PLI district is somewhat limited unless approved by a zoning variance. In the experience of TSAIA the Municipality has been lenient in allowing departures from the allowed use limitations, perhaps in part due to recognition that PLI is not necessarily an appropriate zoning designation for airport lands. The Municipality has stated its intent to complete the preparation of an airport-specific zoning district replacing the patchwork of PLI, T, and I-1 zoning on Airport lands (ref. *West Anchorage District Plan*; Anchorage Municipal Code Title 21 Section 21.04.060A.). Therefore, airport PLI zoning alone is not considered a prohibitive constraint for most of these lands, at least for the purposes of this 20-year industrial lands analysis.

Additionally, the largest of the three Airport tracts located south of Raspberry Road is the recently acquired former FCC tract (39 acres). The Airport planning managers suggested that the Industrial Land Assessment inventory of potential industrial lands include this site. In review of recent planning processes, this analysis considers the south FCC tract to be, on a relative scale, the least likely among the non-aeronautical use lots in the Airport Master Plan to become industrial areas. The FCC lot could be affected by the local community prioritization of this site for parks and open space use. The *West Anchorage District Plan* (WADP), adopted by the Anchorage Assembly in 2012, designates

this parcel in a manner that recognizes Airport ownership and use subject to FAA restrictions. However, it also overlays a "Parks and Natural Open Resource" Alternative Land Use Classification on the property. This is consistent with the way the WADP classifies other open space priority areas including the Coastal Trail, Sisson Loop, Connors Bog, and Little Campbell Lake areas on Airport land. This reflects the Municipality's prioritization of this site as future open space as part of a potential comprehensive land exchange agreement with the Airport. The report and findings of the West Anchorage Land Trade Task Force (October 2014), states that the Municipality and the public have a long-term primary interest and need in the FCC parcel. Municipal officials and community representatives on the Task Force proposed future use as parkland or as an airport buffer. These factors make the future use of the site for industrial development uncertain, such that this Industrial Land Assessment recommends to avoid counting this acreage when estimating the community's net supply of industrial land.

Finally, the Anchorage Economic Developing Corporation (AEDC) recently completed a study with the State of Alaska and a consulting firm to determine the potential for development of an air cargo logistics industry accessing the Airport. Were such an industry to develop, it may compete with existing industrial users for space in and around the Airport.

As of this writing, the global logistics study was available on the AEDC website at the following URL:

http://aedcweb.com/wp-content/uploads/2014/10/AirCargo-Economic_Development_Opportunity.pdf.

Given these constraints, the industrial land supply estimate includes the acreages of the former Kulis site, Airport-owned uplands along the south side of International Airport Road (north of Connors Bog), and two of the Airport-owned parcels south of Raspberry Road at its intersection with Sand Lake Road.

South Anchorage Subarea

Net buildable, available supply of Tier 1 industrial-zoned land: 73.4 acres

South Anchorage has more buildable acreage of industrially zoned land than any other subarea in the Municipality. Most of its industrial-zoned land supply consists of larger parcels than industrial lots available in other subareas. However, unlike most of the other subareas, South has very little PLI or T zoned land available for future industrial use. Therefore, the total net buildable supply in South Anchorage, when factoring partial and significant site constraints and commercial utilization rate on industrial land in the Bowl, is only 112.1 acres.

Map 29 depicts the net buildable land supply in South Anchorage. Almost 60 percent of this land supply is located in the I-1 district, and nearly all of the remainder is zoned I-2.

The industrial zoned supply includes 15.8 acres of Tier 3 (less than half-acre lot size and/or significantly constrained) land, after factoring in the commercial utilization rate (Table 25). Most of the 8.0 acres of I-1 zoned Tier 3 land is comprised of lots smaller than a half acre. In contrast, the almost equal amount of I-2 zoned Tier 3 land is larger lots that are significantly constrained because of environmental or wastewater service limitations. Most of the 22 acres of Tier 2 land consists of a cluster medium to large sized parcels in the I-1 district straddling King Street north of 92nd Avenue, all partially constrained by wetlands.

Other than the south King Street and C Street corridors (discussed below), much of the land supply in the South Anchorage subarea is comprised of scattered individual or groups of small to medium-size parcels, in a similar pattern as in the Central Anchorage subarea. Several are pockets of small, individually owned lots which are vacant or marginally used that do not have water or wastewater services. There are several undeveloped parcels remaining in the Huffman Business Park I-1 district. Some scattered vacant or marginally used lots exist along the Old Seward Highway corridor. The largest is a cluster of partially vacant private and municipal lands along the east side of the Railroad Corridor around 92nd Avenue. Another cluster of lots line the west side of Old Seward Highway south of 100th Avenue. Scattered B-3 and I-1 zoned parcels exist between O'Malley Road and Huffman Road.

The most significant area of vacant or marginally used lots outside of the King Street and C Street corridor is located on the south side of Lore Road, one block east of the New Seward Highway, at the northwestern end of the Cinnabar Loop industrial area. This includes a vacant 10-acre parcel fronting on Lore Road and a number of smaller lots to the south. A number of other parcels in active use in the Cinnabar Loop vicinity meet the thresholds of low FAR and low BLVR used by this analysis to identify potentially redevelopable lands.

However, the majority of the remaining land supply is clustered among vacant, partially vacant, and marginally used lands in the King Street and C Street corridors south of Dimond Boulevard. A cluster of lots, constrained by Class C Wetlands, comprising around 20 acres in total, straddles King Street just north of 92nd Avenue. Several medium-size tracts also exist north of 100th Avenue on either side of King Street. Among these is the King Street parcel owned by Fairweather, an oil services related company. Another is a pair of adjoining lots, about 7.5 acres between them, advertised as a future distribution warehouse development site along 100th Avenue abutting the Railroad Corridor on the west side.

The two largest areas of net buildable land supply available to industrial use in South Anchorage are along C Street. The first is comprised of the northeast and southeast quadrants of the intersection of C Street and O'Malley Road. The lots in the northeast quadrant, between O'Malley Road and the Cabela's parking lot, are considered likely to come under market pressure to be developed as retail commercial as a sewer line is extended to the east side of C Street in that area. The lots in the southeast quadrant are used only seasonally as snow storage.

Other vacant lands south of Dimond Boulevard between C Street and Minnesota Drive are not expected to contribute industrial land supply. Among these is Laurel Acres, a large, paper platted (i.e., unimproved) subdivision located on the east side of Minnesota, extending between Dimond Estates Mobile Home Park in the north to a religious institution (City Church) at 100th Avenue to the south. The area is zoned for residential development. Various public agencies own some of the parcels; however, a majority is privately owned by multiple individual property owners.

The municipal Public Works Department is in the process of purchasing two of the four large privately owned lots that comprise the eastern portion of Laurel Acres Subdivision. The four lots are located along the west side of Arctic Boulevard (extended). Public Works is attempting to acquire the lots in order to locate a Vactor plant for storm water sediment treatment, and expand the existing snow dump adjacent to the east. All four lots remain zoned R-1. They could be available for future development for public facilities (e.g., the Vactor plant) or commercial or even industrial use, if re-designated for such use in the Comprehensive Plan and subject to a rezoning process.

The remaining lands within the study area west of C Street are considered unlikely to be available for industrial use. These include a dedicated municipal park and two tracts owned by CIRI that are committed to non-industrial (commercial and residential) use.

The second group of buildable industrial properties is along the east side of C Street. It includes three municipal HLB properties zoned I-2 abutting the municipal snow disposal site north of 100th, as well as four medium-size lots to the west of the snow dump that are currently zoned R-1. A discussion of these lots and other existing HLB lots in the Bowl follows.

Municipality of Anchorage
Anchorage Industrial Lands Assessment

Net Supply of Buildable Industrial Land

South Anchorage Subarea

- Unconstrained Land
- Partially Constrained Land
- Significantly Constrained Land

- Redevelopable land where site FAR < 0.10 and BLVR < 0.75
- Parcels 1 acre or larger in size
- Lands partially or significantly constrained only due to no water and/or wastewater service.

- Subarea Boundary
- Zoning Boundary

N

0 500 1,000 2,000 Feet

Imagery: 2012 Pictometry

Map 29

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Municipal Heritage Land Bank (HLB) Lands in the Bowl

The Heritage Land Bank (HLB) is a division of the Municipality's Real Estate Department, which works with other municipal entities such as the Community Development Department, Anchorage Community Development Authority, Parks and Recreation Department, Anchorage School District, and the Anchorage Fire Department, among others, to provide land needed for a variety of public purposes.

Consultations with HLB indicate a limited number of HLB parcels in the Anchorage Bowl are potentially available for industrial purposes given the HLB's existing land bank portfolio. Municipal planners reviewed a number of candidate industrial sites on a parcel-by-parcel basis. Table 29 identifies specific HLB sites and notes any significant limitations or constraints.

For the most part HLB lands are not available for future industrial development for the following reasons:

1. High-value wetlands that provide important environmental mitigation measures subject to U.S. Army Corps of Engineers permitting requirements;

2. Contamination that would require remediation;

3. Difficult parcel configuration;

4. Zoning or designation by municipally adopted plan for residential or commercial use; and,

5. Designations for public use only.

In a number of cases, certain municipal lands are encumbered by "reverter clauses" that require the reconveyance of the property back to the previous owner (usually the state or Federal government) if the property is no longer used for the specified public purpose.

HLB parcels within the Industrial Land Assessment study area are included in the maps and acreage counts of gross land supply, including vacant, partially vacant, and marginally used lands. If the following Table 30 indicates a HLB parcel is "potentially available," then the parcel's acreage is also included in the net buildable land supply maps and counted toward the total acres of available industrial land for this study.

Table 30. Heritage Land Bank – Industrial Study Parcels

Parcel Location	Status
HLB Parcels 5-001, 5-002-A, 5-021, 5-020, consisting of undeveloped natural open space woodland and bog on the west side of Minnesota Drive extending from Connors Lake Bog/Javier de la Vega Park in the north to Strawberry Road in the south.	These parcels include high value wetlands, some of which are located in conservation easements. These lands are designated in the *West Anchorage District Plan* as open space.
Blueberry Lake HLB parcel located on east side of Minnesota Drive between CEA utility campus lands to the north and Raspberry Road parcels to south.	This parcel consists of wetland forest around an open waterbody and is subject to a permanent conservation easement.
HLB 5-002-B, a narrow parcel including uplands located on southeast corner of Raspberry Road and Minnesota Drive	**Potentially Available.** Includes some uplands with no conservation easement; the lot layout is very narrow which may constrain industrial use. It has been found too narrow for MOA Street Maintenance vehicle shops for heavy equipment.
HLB Parcels 5-005 and 5-006 located between C Street and Arctic Boulevard (extended), south of 92nd Avenue ROW.	**Potentially Available.** Zoned industrial; however, affected by wetlands. If other lands are not acquired, it may be used in part for expansion of existing municipal snow dump abutting to the south, or to locate a four acre Vactor plant for storm water sediment treatment.
HLB 5-010, 5-011, and 5-012, a trio of small lots located on the north frontage of O'Malley Road, part way between the Alaska Railroad corridor and C Street.	These undeveloped parcels are subject to a reverter clause and therefore available for public use only, such as for support for the municipal Street Maintenance Division.

Table 30 continued

Parcel Location	Status
HLB 4-021 containing the Brother Francis Shelter. HLB 4-046 and 4-047, comprising most of the site of the former Alaska Native Hospital.	These lots were acquired by HLB in anticipation of the Knik Arm Crossing (KAC) and Glenn Highway to Seward Highway connection projects. **Native Hospital Site (Eastern Lot) Potentially Available for Limited Use** The two former Native Hospital site parcels are impacted by high and very high seismic ground failure hazard designation. They may also be future right-of-way for the Knik Arm Crossing project. In the interim, these parcels could be used for lay-down yard storage or other low intensity industrial uses on a temporary (lease) basis. They seem unlikely to be developed under long-term lease for more intensive industrial use. The western HLB lot is designated for mixed-use residential in the Downtown Comprehensive Plan.
HLB 3-002, located on east side of Reeve Blvd., north of Viking Drive.	**Potentially Available.** Mostly woodland under Railroad lease to HLB. May be affected by steep slope or wetlands.
HLB 3-004, located along east side of Reeve Boulevard and north of Commercial Drive	**Potentially Available.** Contaminated site affected by steep slopes, but could be remediated and made available in part for future industrial development.
HLB 3-010, abutting north end of the new Special Olympics center on Mountain View Drive.	This lot is for use as driveway access to adjacent parcels.
HLB 3-069, on northwest corner of Commercial Drive and Mayer Street in the Mountain View neighborhood.	**Potentially Available.** This is a vacant, undeveloped parcel that was part of lands recently re-platted into three parcels. AWWU and Street Maintenance each received one parcel and HLB retained the remainder parcel of approximately 3 acres, which now comprises HLB 3-069. The lot is zoned I-1 and is potentially available for industrial.

Table 30 continued

Parcel Location	Status
HLB Parcel on north side of Porcupine Drive in the Commercial Drive industrial area	HLB parcel consisting of an old one-story office building complex. Although zoned for industrial use in an industrial area, it is required to be used for public or institutional use only, subject to a reverter clause. It is not available for commercial or industrial use.
HLB Parcel 3-009 on northwest side of Mountain View Dr., north of Glenn Highway intersection	Municipal Paint/Sign Shop.
HLB Parcel 3-011 on NE corner of Glenn Highway intersection with Airport Heights/Mountain View Drive	Undeveloped wetland wooded lot reserved for future right-of-way for the Glenn Highway.
HLB and other public lands in East Tudor Road and Far North/Bicentennial Park vicinity (Not included in Industrial Land Assessment study area).	None of the HLB parcels in the vicinity of Far North/Bicentennial Park are considered to be candidates for industrial development. They are primarily intended for park, open space, and wetland use. The Bureau of Land Management (BLM) has recently renewed its long-term lease on the Campbell Airstrip area.

Fire Island

Fire Island is located approximately three miles directly west of Point Campbell (Kincaid Park) and Ted Stevens Anchorage International Airport. Approximately five miles in length and two miles wide, the island contains approximately 4,240 acres, which is mostly undeveloped land except for wind power turbines in the southwestern part of the island. It is included in the study area to assess its potential availability for more intensive development within the planning horizon.

Ownership of most of the island has transferred from federal agencies to Cook Inlet Region, Inc. (CIRI), which filed land selections on Fire Island following the Alaska Native Claims Settlement Act (ANCSA). Remaining FAA lands were declared in excess of FAA needs and are in the process of being transferred to CIRI, which will then own all of Fire Island except for a U.S. Coast Guard reserve area of approximately 200 acres around Race Point, a natural, deep water harbor site on the north side of the island.

CIRI is the largest private landowner in Southcentral Alaska, with 1.3 million acres of subsurface estate. CIRI owns, manages, and invests in significant commercial and residential real estate developments in Alaska and the South 48

states. CIRI Land Development Corporation has expressed in a consultation for the Industrial Land Assessment project an interest in future development of Fire Island for residential and/or industrial uses.

The consultation with CIRI real estate and wind energy staff highlighted existing and future wind energy projects on Fire Island. So far 11 wind turbines have been constructed on the southwestern corner of the island. This alternative energy project produces about 18-megawatts of electricity that is delivered to Chugach Electric Association (CEA) via submarine cable. A second phase of wind turbine development has begun construction. A future third phase is presently on hold.

There is no ground transportation access to Fire Island. Access remains limited to small boat or aircraft. The CIRI Land Development Corporation remains interested in the construction of a causeway that would connect Fire Island to the Anchorage Bowl. A causeway would create accessibility for more intensive land use development opportunities.

However, the distance from developed portions of the Bowl to Fire Island is comparable to the distance across the Knik Arm between Anchorage and the Mat-Su Borough at Point MacKenzie. Historical cost studies indicate that the access alone would represent a significant financial investment. A 1988 feasibility study evaluated the construction of a bridge linking Fire Island with Anchorage at an estimated cost of $55 million (1980s dollars). Investments in connecting roads and utilities would also need to be made on both Fire Island and the Bowl sides of the causeway. Increasing cost and environmental permitting issues, as well as the distance factors involved would require the Municipality to make a major investment and reprioritize its transportation improvements from current adopted planning priorities, in order to make access to Fire Island a reality within the 20-year planning horizon.

Neither the Municipality nor the State has any plans to study or build a causeway. The Municipality of Anchorage *Metropolitan Transportation Plan* (MTP) establishes project priorities through year 2035. Its list of transportation projects does not include so much as an access reconnaissance study, even among the longer-term and unfunded illustrative (aspirational) projects. Current State and Federal budget constraints, and competing State and local project priorities, and cost factors continue to keep Fire Island access from being a substantive priority in transportation plans. It may be that, beyond the planning horizon of this industrial land assessment study, the cost of providing direct bridge access from the International Airport to Fire Island will be justified, perhaps as part of a larger project. Imaginable scenarios might include the arrival of a massive new driver industry for the state (e.g., air cargo logistics), or a "Turnagain Arm Crossing" connecting Anchorage through Fire Island to the Kenai Spur/Pipeline road route to Nikiski and Kenai.

Other factors limiting development potential during the planning horizon may (or may not) limit industrial development potential. These include site factors such as topography, seismic hazards, bird and sensitive wildlife habitat, and

airport height restrictions on the northern portion of the island. Additionally, future use of the Island remains undesignated in the Comprehensive Plan, and the island is zoned Transition (T). Future intensive development would require amending the city's comprehensive plan and zoning designation for the island. Industrial uses may compete with other potential land uses, such as public facilities or even residential. The northern half of the island, which is directly underneath flight approaches at TSAIA and includes a potential deep water port site, does appear to be more appropriate as a light industrial rather than residential or commercial use area.

Because significant changes would need to occur in current and forecasted growth trends, adopted State and Municipal planning policies, transportation technology, and/or public and private investment priorities, Fire Island and its approximately 3,400 acres of buildable land under the current trends scenario appear to be prohibitively constrained from being reachable for ground access industrial development within the 20-year planning horizon. It seems likely to continue to be limited to utility power generation. While trends can change, the information above suggests that the more prudent course for the municipal wide land assessment is to avoid assuming the availability of these lands as part of the industrial land supply available to satisfy industrial land demand through 2035, at least under the current trends growth scenarios and policies.

Joint Base Elmendorf–Richardson (JBER)

Joint Base Elmendorf-Richardson (JBER) was formed by combining Elmendorf Air Force Base and Fort Richardson as a result of the 2005 Base Closure and Realignment Commission. The 673d Air Base Wing was activated as the host wing combining installation management in July 2010. Today, the military installation and reserve occupies some 73,014 acres. The installation and reserve is located on the north-northeastern border of the Anchorage Bowl, and on the west-southwestern border of Chugiak-Eagle River. Most of JBER (about eighty-five percent) consists of Federal lands that were originally withdrawn from the public domain. These lands were most recently administered by the Bureau of Land Management (BLM) on behalf of the Department of the Interior. The remaining portions of JBER (approximately fifteen percent) are former private in-holdings, mostly homesteads that were purchased or reacquired by the U.S. Government, directly for the military, and are designated as fee simple title or reacquired property.

Some observers have speculated that various JBER properties constitute a potential source of surplus, undeveloped land that could serve as a prime supply of industrial lands. On the other hand, military officials have generally tended to view the supply and demand of military property through the lens of encroachment. The U.S. Air Force, for example, defines encroachment as "any deliberate action by any governmental or non-governmental entity or individual that does, or is likely to inhibit, curtail, or impede current or future military activities within the installation complex and/or mission footprint; or any deliberate military activity that is, or is likely to be incompatible with a community's use of its resources."

Land use development outside of JBER poses cumulative impacts to military operations. Examples of land development impacts include: realignment of the Alaska Railroad Right-of-Way, the proposed bridge over Knik Arm to Point MacKenzie in the Matanuska-Susitna Borough with access through JBER property, critical habitat designation for Cook Inlet Beluga whales, and commercial or long-term real estate interests involving rights-of-way, easements, land use permits, leases, outgrants, land transfers, exclusive use areas, and special concessions, many of which are viewed as detrimental to current or future military operations and training requirements. As demand in the Anchorage Bowl and Chugiak-Eagle River area for home building, shopping malls, and industrial parks continues to increase, so does the frequency of potential conflicts associated with military-generated noise impacts and requests for use of JBER lands for recreation and other purposes such as industrial development.

Moreover, as military budgets have been reduced there has been increasing interest in finding new ways to generate revenue to support base operations. One method known as Enhanced Use Leasing (EUL) is a relatively new capital asset management tool in the U.S. military's real property toolbox. EUL provides an alternative to the traditional approach of acquiring, constructing, or upgrading land and/or facilities. It provides a mechanism for receiving rent, in cash or in-kind services at no less than fair market value of the asset, by leveraging assets that are currently available, but not excess to military needs.

For its part, the Air Force's EUL program seeks to partner with public entities or private developers to create mutually beneficial commercial projects on non-excess Air Force real property. The goal of the EUL program is to optimize the full value of its real property assets. Air Force EUL projects throughout the South 48 states have been implemented ranging from energy to commercial real estate development.

Recently, one constraint that would have historically limited leasing of JBER land for non-military use has been removed. As previously noted, eighty-five percent of JBER lands were designated as withdrawn and under the administration of the BLM. BLM was entitled to receive revenues generated from leases on withdrawn lands, so there was no incentive for JBER to pursue or agree to a EUL on those lands. Now, according to JBER staff, BLM no longer administers any new outgrants for use on the base, thereby providing the base with the authority to enact them.

However, there remain several significant constraints that limit the potential utility of EUL at JBER. First, there is a general federal government policy that federal lands must be used for a federal purpose. If the federal government does not need the land then it may be designated as surplus property. If Base lands are not needed for a military use, then they must be returned to the BLM.

A second constraint is that JBER does not need a EUL to support its long-term mission mandate. In other military installations, for example, there may be opportunities for an EUL to develop a hotel or facility that can complement a

specific need on that particular military installation. JBER apparently has, with the exception of certain utility facilities or services, what it needs to operate on base. Therefore, the only incentive for a EUL would be to enhance revenue generation. However, revenue generation is not a function of the military, and would only occur if it is found not in conflict with but rather in support of its overall mission.

A third constraint is that JBER actively uses most of its land area for base operations, training, or as a buffer zone for sensitive land management purposes. The base was historically much larger, including parts of what are now the Chugiak-Eagle River area and Chugach State Park. While the base has shrunk in area from its largest extent, its training mission and operational needs over time have not diminished. Information provided by JBER indicates that the Base has a shortfall of 11,345 acres based on calculations from its unit training requirements and U.S. Army minimum standards (ref. U.S. Army Training Circular 25-1). Consequently, the military makes up for this deficit by transferring some training activities to other areas within the state, such as Donnelly Training Area in Interior Alaska. However, training in away locations is substantially more expensive, and so is minimized to the extent possible.

Operations on the base have increased recently as overseas deployments have been reduced while domestic training requirements have increased. Some parcels in the base that may not currently be viewed by some observers, or the general public, to be fully in use may actually be used for training, storage; or may be needed for future expansion; or may be located fully internal to the base in sensitive areas not appropriate for outside civilian encroachment or use. Some training areas, for example, require large buffer zones due to year-round live-fire weapons training using explosive or non-explosive ordnance in various training areas. In consultation with Planning Division staff, military officials and civilian contractors alike have emphasized the need for greater public awareness regarding the use of the Training Areas, as well as the associated operating requirements of JBER. Map 30 (provided by JBER staff) illustrates that its training ranges, of which some are used for live-fire exercises, comprise nearly all the seemingly "undeveloped" portions of JBER along the Glenn Highway and west of Eagle River.

A fourth constraint is that roughly sixty percent of the fee simple and withdrawn lands on JBER are subject to provisions of land acts or agreements that include the North Anchorage Land Agreement (NALA); the Alaska National Interest Lands Conservation Act (ANILCA); and, the Alaska Native Claims Settlement Act (ANCSA).

NALA is recognized by BLM where it pertains to land title transfer of certain lands covered by the agreement. Alaska Native regional corporations such as Cook Inlet Region, Inc. (CIRI) and Native village corporations such as Eklutna, Inc., have top filed claims to most of the lands located within JBER, and they have the first claim to these lands if they are declared in excess. Native regional and village corporations view these lands as the remaining part of their land entitlement due from the federal government that have yet to be finalized.

Furthermore, they have a legal right to these lands if they are considered surplus and unnecessary for military use.

JBER has discovered through experience that if it attempts a EUL for an extended lease period of 25 years or more, Native regional and village corporations will most likely pursue their entitlement rights to lands not deemed necessary for federal use. As noted above, the Air Force cannot keep land if there is not a specific need. These constraints in combination are deemed to be major obstacles to the use of nearly all existing JBER property for non-military industrial uses within the 20- to 30-year community planning horizon, assuming that current municipal land management trends and policies continue.

Municipal planning staff developed the following criteria to determine if any specific individual sites with industrial development potential exist in JBER, and assess the suitability of those industrial study sites:

- Areas for which there is no identified existing or future need to support JBER functions for a 25-year or more lease time horizon;
- Areas where the non-military uses of the site would have no identified impact on existing or anticipated JBER uses on adjacent lands.
- Areas located at the Base periphery, which can be accessed from roads exterior to the Base, and not interior or sensitive to Base operations.
- Areas with road access to freight trucking routes, and preferably with potential to be served by utilities (e.g., sewer and water).
- Areas near other industrial uses, to effect clustering and compatibility.
- Areas at least 5 to 10 acres in size.
- Areas that can accommodate site-specific industrial or utility use types compatible with JBER and for which there is an identified need in the community.
- Areas subject to ongoing or previous agreements by JBER for non-military use.

These criteria were prepared in the context of awareness of encroachment issues that potentially impact JBER, and the need to minimize impacts to its mission sustainment function.

According to these criteria, an assessment of JBER lands identified only four sites in JBER worthy of consideration as industrial study sites. (A fifth study site located east of the Port of Anchorage and north of Government Hill neighborhood was removed from consideration after receiving additional information and clarification from JBER.) These industrial study sites tend to be located at the periphery of the Base, away from sensitive operational areas, and adjacent to existing industrial districts or local community utility facilities. The

municipal Planning Division researched the status of the sites and discussed them in some detail with officials and contract staff from JBER, and parties to NALA (MOA; Eklutna, Inc.). Research and discussions revealed a complex and politically sensitive land management system that is quite different from the typical EUL arrangement conducted in the Lower 48. Non-military use of several of the sites noted above may result in a land trade agreement but those agreements are subject to negotiations as well as a formal approval process per ANCSA, NALA, and ANILCA provisions.

1. Regional Landfill Expansion Site (see Map 31). JBER is not a party to NALA, although it is a party to other federal legislation such as the 2012 National Defense Authorization Act authorizing a three-party conveyance between the Municipality, JBER, and Eklutna, Inc. One scenario under a potential agreement would provide the Municipality with a tract located just to the west of the existing Anchorage Regional Landfill, which is located at the intersection of the Glenn Highway and Hiland Road in Eagle River. This tract, depicted in red in Map 31, may satisfy future expansion needs of the landfill. The Industrial Land Assessment does not assume this land would be available for non-public facility industrial development.

   Map 31 Note: Municipal planners have not confirmed the exact location of the boundaries of the tracts to be subject to a land conveyance. These boundaries, may still be under negotiation. The boundaries in Map 34 do not follow any specific information from a municipal agency or JBER.

2. Boniface Parkway Site (see Map 32). Also subject to the possible three-party conveyance between the Municipality, JBER, and Eklutna, Inc., is a 130-acre tract occupying the northeast quadrant of the Glenn Highway and Boniface Parkway intersection. Any agreement between the three parties at the end of negotiations would need to be clarified by a Memorandum of Agreement. Details of a potential land exchange are under feasibility review by the parties. Therefore, JBER could not provide an estimate of the acreage, future allowed uses, or other characteristics of portion of Boniface lands which may be subject to a potential land exchange agreement.

   This Industrial Land Assessment assumes that, in the event of a land exchange agreement, JBER would be unlikely to release more than 100 acres of the Boniface site, because consultations with JBER staff indicated that JBER would need to preserve a no-development zone along the Base fence line as a means to protect the military mission. Additionally, this report assumes that JBER would place restrictive covenants on the use of the property, because the property is located in the Accident Potential Zone II (APZ II) of the north-south runway at Elmendorf, as depicted on Map 32. APZ based guidelines prohibit residential use, and favor low density light industrial uses, with few if any on-site employees or customers. Because this runway is JBER's primary mission asset, there is reason to believe JBER might place additional restrictions against commercial retail development.

Such restrictions, as well as the absence of a frontage road along the Glenn Highway (access is still possible from Boniface but considered problematic due to traffic volumes from the Boniface Gate), could reduce the value of the property to Eklutna, Inc. A portion of the site is also impacted by wetlands and a former military landfill site, and potential contamination from historical military training exercise use.

The Alaska Department of Environmental Conservation (DEC) database indicates the old landfill site is 15 acres in size. Using this information, municipal planning staff estimated that, in the event of a land exchange agreement, as much as 84 acres of land in the Boniface site may become available for low-density light industrial type use within the planning horizon. Maps and satellite imagery suggest the significantly constrained wetland area is approximately 14 acres. Therefore, with the information currently available this industrial land inventory estimates the effective holding capacity of the buildable site may be up to 70 + (14/2) = 77 acres of new industrial land, if a land exchange were to occur. Seventy-seven acres is a gross, order-of-magnitude estimate by municipal planners. The Municipality should correct this estimate as needed after the outcome of a land exchange agreement becomes available.

3. Artillery Road Site (see Map 33). The Chugiak-Birchwood-Eagle River Rural Road Service Area (CBERRSA) street maintenance department is potentially interested in leasing a JBER tract located between the Eagle River Wastewater Treatment facility and the Artillery Road industrial district of Eagle River. One scenario for this site contemplates its use as a potential snow disposal site. At the time of this writing there has been informal discussion among municipal agencies about the pros and cons of obtaining this area through a lease agreement with JBER but these discussions have not been formally initiated with the Base. The potential cost of any leasing arrangement based on fair market value may preclude further consideration of this site. Though as Map 33 shows it is isolated from the contiguous Army training areas by the neighboring Eagle River Water and Wastewater Utility (AWWU) wastewater treatment plant, which currently operates under a 25-year lease agreement with BLM, the Artillery Road site is located within JBER Training Area #410. As the need for training area space and buffering from encroachments have increased, the military is generally reluctant to give up designated training areas. Therefore, the Industrial Lands Inventory has determined this site is unlikely to be available to industrial use.

4. Port of Anchorage Vicinity. A potential study site located east of the Port of Anchorage and north of Government Hill neighborhood was removed from consideration after receiving additional information and clarification from JBER. Map 34 depicts the general area.

5. Eagleglen Golf Course Site (see Map 35). JBER closed (summer 2014) the Eagleglen Golf Course, located east of Reeve Boulevard, between the Ship Creek watercourse and Mountain View neighborhood. At the time of this writing, JBER has transitioned the golf course to the Eagleglen Fitness Park.

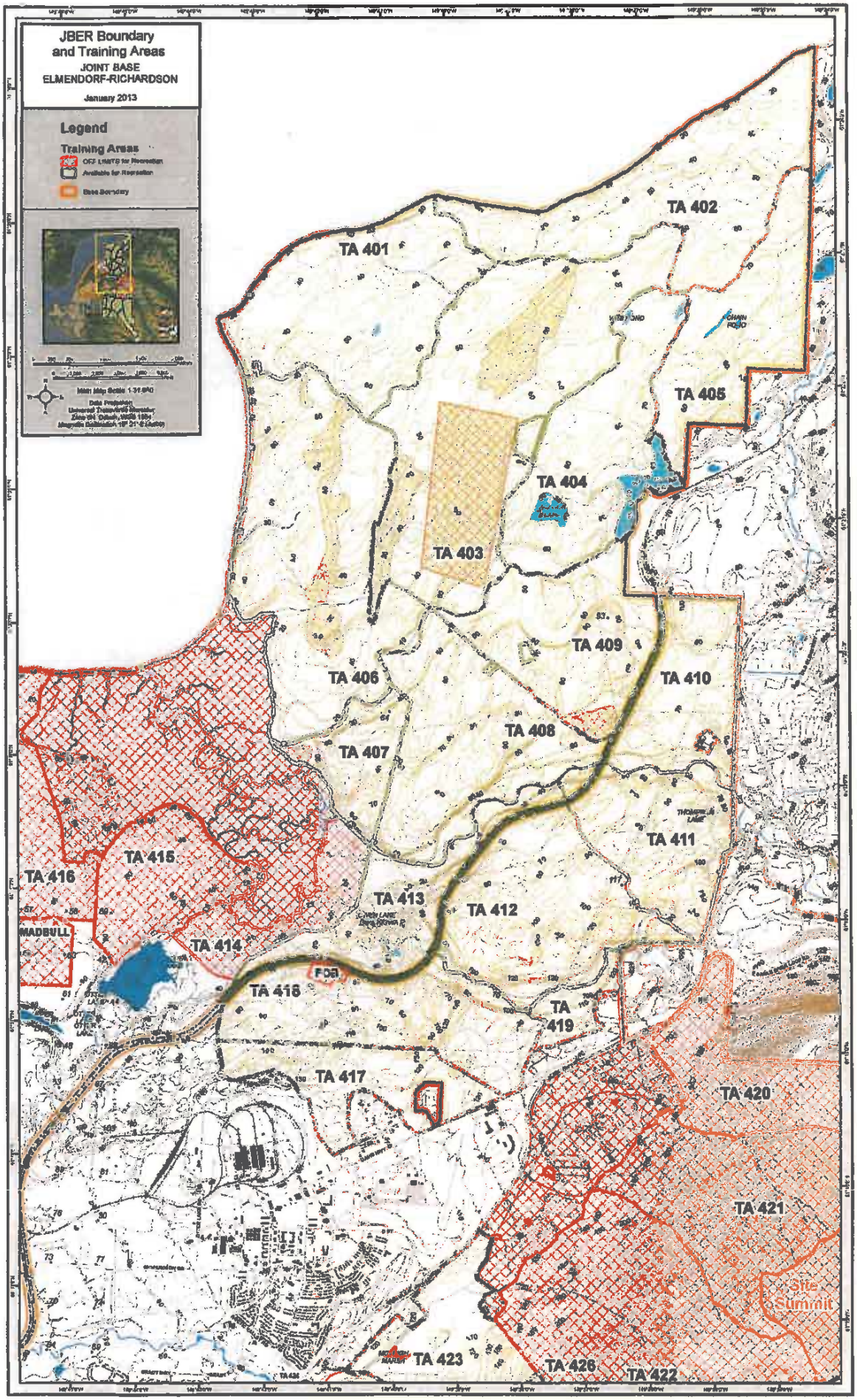
The site is south of Ship Creek without road access to the rest of the Base. Consultations with JBER staff indicate that the 673d Force Support Squadron, which has maintenance responsibility for this site, has indicated that they prefer to keep this area as a JBER recreation area although JBER is considering several options.

Highlighted in red in Map 35, the area of most relevance to the Industrial Land Assessment is the 130 acres concentrated at the western end of the Eagleglen Fitness Park, outside of the JBER Clear Zone and adjacent to the Ship Creek industrial district at Reeve Boulevard. Anchorage's Ship Creek industrial district is a strategic distribution hub for the regional economy; however, it has limited remaining developable land. From an industrial lands perspective, if it were ever determined in excess to military needs, the 130 acres at the west end of Eagleglen would be geographically positioned to accommodate growing demand for additional warehousing and freight distribution uses, extending the Ship Creek industrial district, in addition to natural buffers from Ship Creek and Mountain View residential neighborhood. An EUL agreement would not necessarily need to involve the Municipality as a direct party. However, given the uncertainty surrounding this area, this study avoids including the land in the estimate of available industrial land supply. If the Industrial Land Assessment report determines there is unmet demand for industrial development expansion within the Ship Creek area, and Eagleglen was determined in excess to military needs, the Municipality could discuss this site further with the military and parties to NALA, as an industrial development strategy.

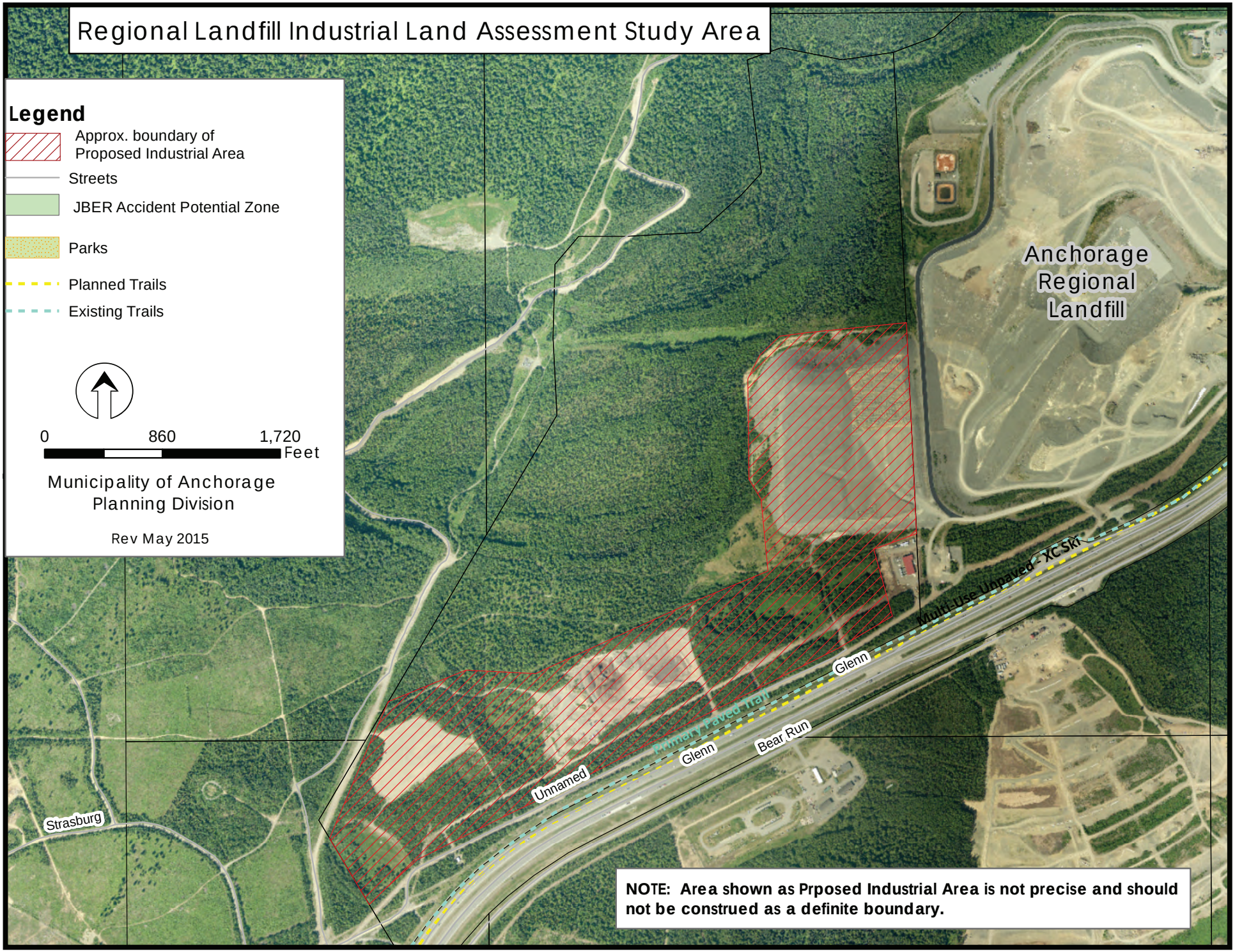
Map 35 Note: Based on comments from JBER, Map 35 depicts a 100-foot riparian buffer along Ship Creek. The JBER Installation Natural Resources Management Plan prohibits timber harvest within 100 feet adjacent to an anadromous water body, and restricted harvest between 100 and 300 feet of that water body. While exceptions to the riparian vegetative buffer can be approved after a review process and potential mitigation.

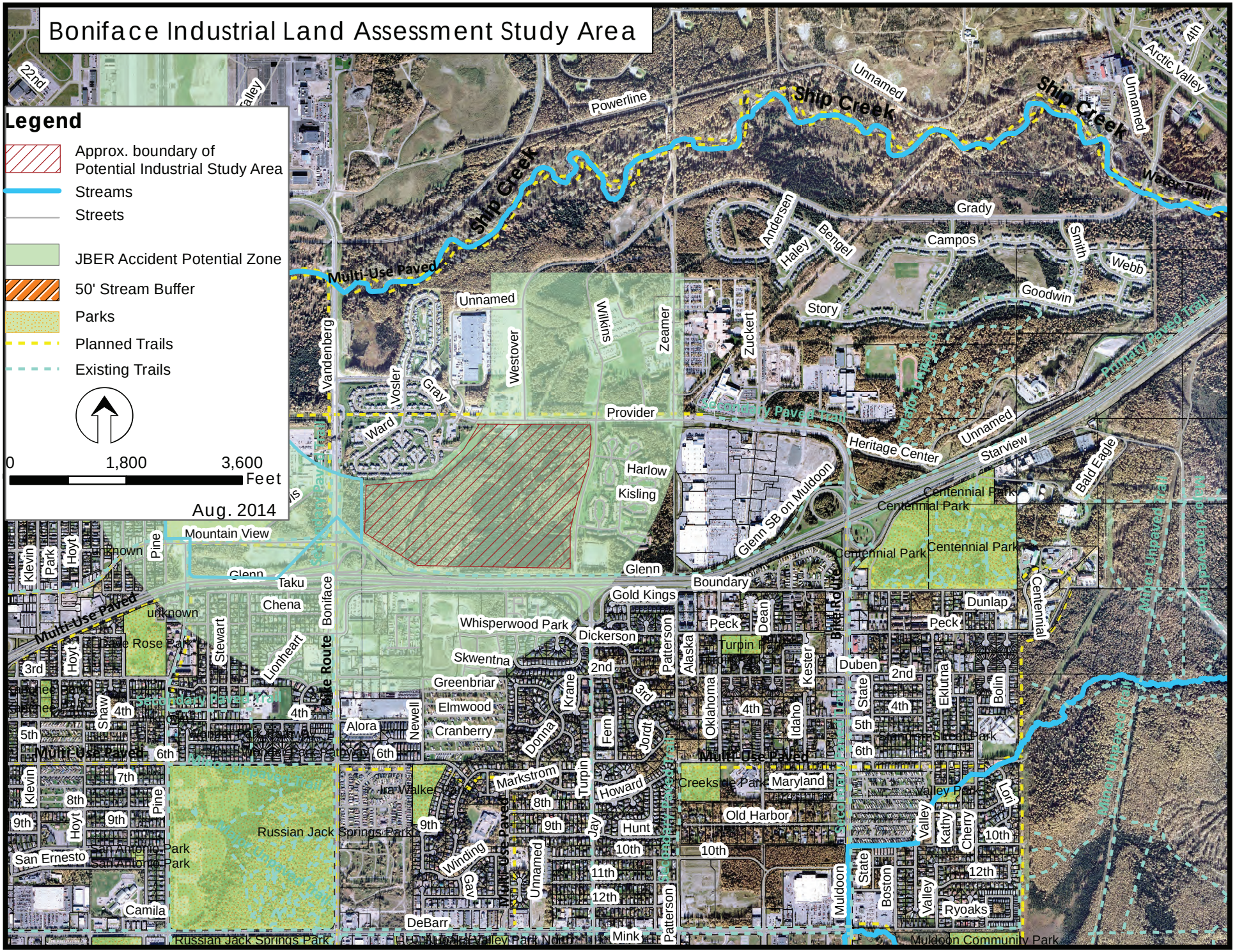
In conclusion, the Industrial Lands Inventory includes only a portion of the acreage of the Boniface Parkway site in its estimate of the industrial land supply available for future industrial development. The Eagleglen site is a possibility; however, it seems as likely to continue as a recreation and fitness area as noted above. The Industrial Assessment finds that the rest of the 73,000-acre military base is unlikely to be available for industrial use within the planning horizon.

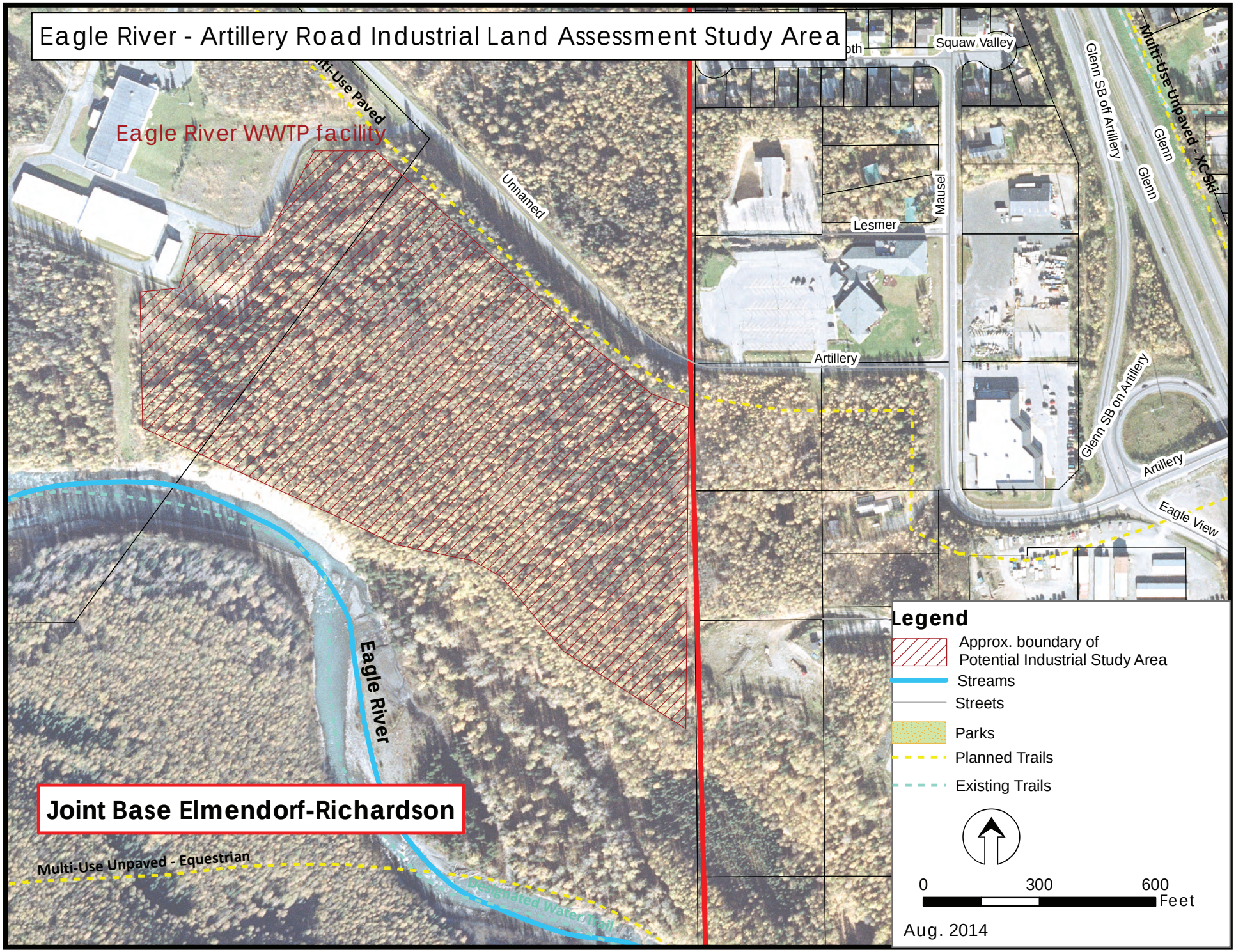
Map 30


JBER Boundary
and Training Areas
JOINT BASE
ELMENDORF-RICHARDSON
January 2013
Legend
Training Areas
TA 401
TA 402
TA 403
TA 404
TA 405
TA 406
TA 407
TA 408
TA 409
TA 410
TA 411
TA 412
TA 413
TA 414
TA 415
TA 416
TA 417
TA 418
TA 419
TA 420
TA 421
TA 422
TA 423
TA 426
MADBULL
Site Summit

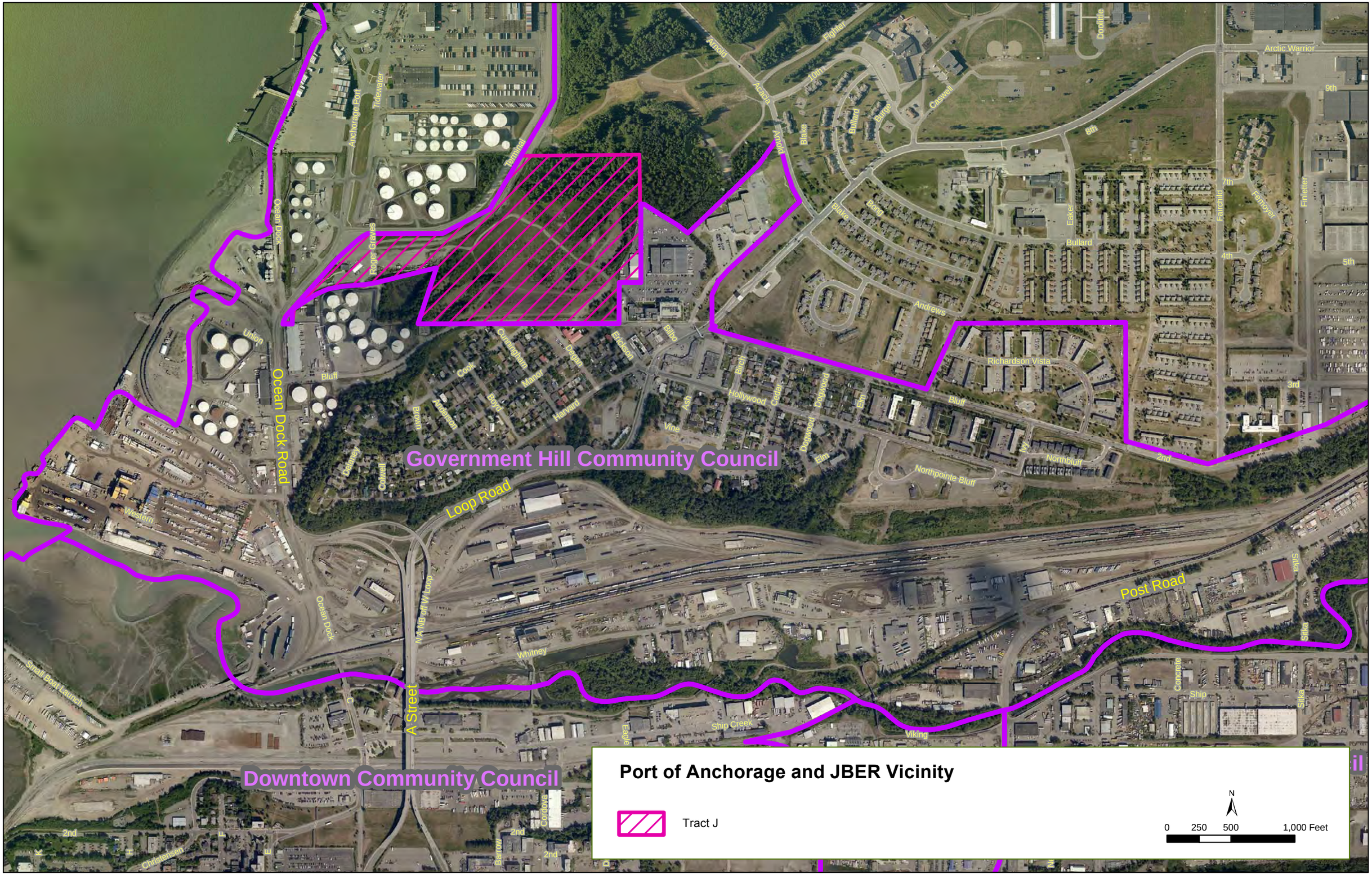
Regional Landfill Industrial Land Assessment Study Area




Boniface Industrial Land Assessment Study Area
Legend
Approx. boundary of Potential Industrial Study Area
Streams
Streets
JBER Accident Potential Zone
50' Stream Buffer
Parks
Planned Trails
Existing Trails
0
1,800
3,600
Feet
Aug. 2014
Ship Creek
Powerline
Unnamed
Arctic Valley
Water Trail
Andersen
Haley
Bengel
Grady
Campos
Smith
Webb
Goodwin
Story
Multi-Use Paved
Vandenberg
Vosler
Gray
Ward
Westover
Wilkins
Zeamer
Zuckert
Provider
Heritage Center
Starview
Bald Eagle
Harlow
Kisling
Glenn SB on Muldoon
Centennial Park
Mountain View
Glenn
Taku
Chena
Boniface
Bike Route
Gold Kings
Boundary
Whisperwood Park
Dickerson
Skwentna
Greenbriar
Elmwood
Cranberry
Alora
Newell
Lionheart
Stewart
Dale Rose Park
Dunlap
Peck
Dean
Patterson
Alaska
Oklahoma
Kester
Duben
Idaho
Eklutna
Bolin
State
Centennial
Turpin
Howard
Markstrom
Creekside Park
Maryland
Old Harbor
Valley
Kathy
Cherry
Lois
Ryoaks
Muldoon
Boston
Hunt
Jay
Winding
Gay
DeBarr
Mink
Russian Jack Springs Park
San Ernesto
San Antonio Park
Camila
Muldoon Community Park
Donna
Krane
Fern
Jordt
Shaw
Pine
Klevin
Park
Hoyt
Unknown
Lois
Map 32


Eagle River - Artillery Road Industrial Land Assessment Study Area
Eagle River WWTP facility
Unnamed
Squaw Valley
Glenn SB off Artillery
Glenn
Multi-Use Unpaved - XC Ski
Mausel
Lesmer
Artillery
Glenn SB on Artillery
Eagle View
Eagle River
Joint Base Elmendorf-Richardson
Multi-Use Unpaved - Equestrian
Designated Water Trail
Legend
Approx. boundary of Potential Industrial Study Area
Streams
Streets
Parks
Planned Trails
Existing Trails
0
300
600
Feet
Aug. 2014

Map 33


Government Hill Community Council
Downtown Community Council
Arnold
Fighter
Doolittle
Arctic Warrior
9th
10th
Acacia
Caswell
Bullard
Burge
8th
Blake
Bong
Faker
Fairchild
7th
Fenmore
Finletter
4th
5th
Andrews
Richardson Vista
3rd
2nd
Northbluff
Northpointe Bluff
Ivy
Bluff
Hollywood
Cedar
Dogwood
Elm
Birch
Ash
Vine
Bilbo
Erickson
Degan
Cunningham
Manor
Harvard
Boyd
Anderson
Brown
Cook
Union
Ocean Dock
Roger Graves
Anchorage Port
Tidewater
Terminal
Ocean Dock Road
Delaney
Colwell
Western
Loop Road
N ANB off W Loop
Ocean Dock
Whitney
A Street
Small Boat Launch
Post Road
Sitka
Concrete
Ship
Ship Creek
Eagle
Viking
Cordova
Barrow
Christensen
2nd
Port of Anchorage and JBER Vicinity
Tract J
N
0
250
500
1,000 Feet

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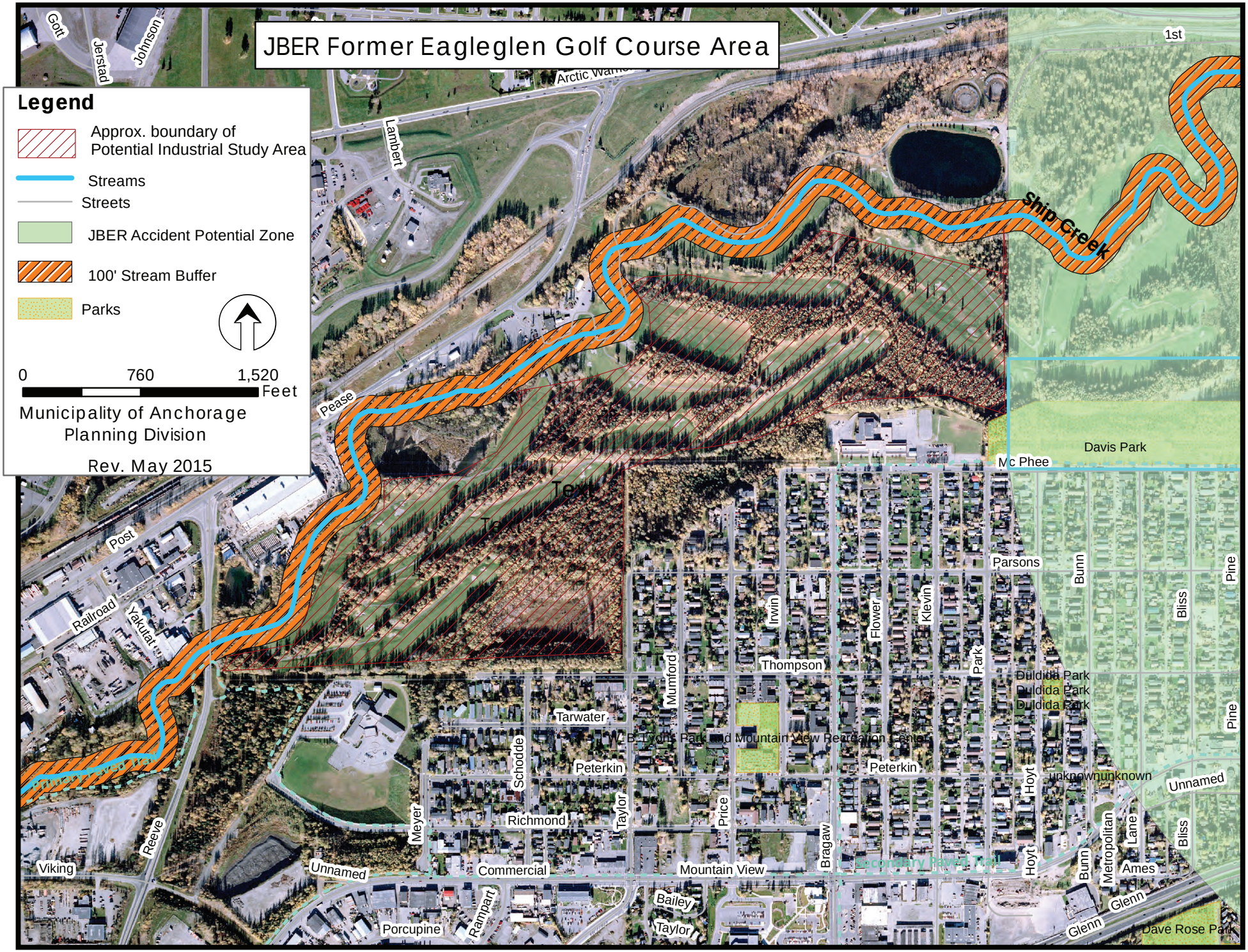
JBER Former Eagleglen Golf Course Area
Legend
Approx. boundary of Potential Industrial Study Area
Streams
Streets
JBER Accident Potential Zone
100' Stream Buffer
Parks
0
760
1,520
Feet
Municipality of Anchorage
Planning Division
Rev. May 2015
Ship Creek
Davis Park
Mc Phee
Pease
Lambert
Arctic
Gott
Jerstad
Johnson
1st
Post
Railroad
Yakutat
Reeve
Viking
Meyer
Schodde
Mumford
Irwin
Flower
Klevin
Park
Parsons
Bunn
Pine
Bliss
Thompson
Tarwater
Peterkin
Richmond
Taylor
Price
Bragaw
Hoyt
Duldida Park
Duldida Park
Duldida Park
unknownunknown
Unnamed
Lane
Metropolitan
Ames
Glenn
Dave Rose Park
Commercial
Mountain View
Bailey
Porcupine
Rampart
Unnamed
Secondary Paved Trail
Map 35

Eagle River and Powder Reserve Subareas

Net buildable, available supply of Tier 1 industrial-zoned land: 41.4 acres

Additional supply in T zoned lands (Powder Reserve): 120.9 acres

Eagle River subarea has a net buildable supply of 42.9 acres of industrial-zoned land, including Tier 1, 2, and 3 lands, after factoring partial and significant site constraints as well as the historical commercial utilization rate of 5.5 percent in Chugiak-Eagle River (Table 28).

Map 36 shows the net buildable land supply in the Eagle River subarea. The largest undeveloped industrially zoned area of Eagle River lies on the north side of North Eagle River Loop Road and east of Spring Brook Drive, across from developed industrial uses lining the west side of Spring Brook. The undeveloped lands lie on the steeper side, and include both I-1 lands and the Eagle River Subarea's entire supply of vacant I-2 land.

The remaining industrial land supply in Eagle River is in the Artillery Road industrial district, and consists primarily of a contiguous grouping of vacant 2.5-acre lots on the south side of Artillery Road, next to the military base boundary. Minor opportunities exist to the south, on significantly constrained lands near the watercourse of Eagle River.

Only a small amount of acreage is anticipated to come from non-industrial districts, other than in the Powder Reserve (see below). The PLI district includes municipal HLB Parcel 1-085, a mostly undeveloped area between Eagle River High School, the State Department of Corrections Hiland Mountain Correctional Center, a municipal Street Maintenance operations and storage area, and the State Division of Forestry facilities. Parcel 1-085 was in the process of being replatted as of the writing of this report. Most of the vacant lots are likely to remain as a buffer between the high school and the correctional facility. Some expansion of the municipal street maintenance yard is possible. Parcel 1-085 is not considered likely to be available for other industrial uses. Likewise, a PC (Planned Community) zoned district south of Parcel 1-085 is currently designated for future commercial and residential (i.e., non-industrial) use.

Powder Reserve Tracts B and C

The Powder Reserve, originally comprised of three tracts, A, B, and C, holds a significant share of the near term urban development potential in Chugiak-Eagle River. Tract A, owned by Eklutna, Inc., is in a gradual process of development as a mixed density residential master planned community with some commercial and institutional uses. Tracts B and C, owned by Eklutna and the Alaska Railroad, respectively, are essentially future reserve lands.

The Alaska Railroad does not presently see its lands in Tract C of the Powder Reserve as a likely future industrial development area within the planning horizon. Further research and consultation with the Railroad would be

important to determine if the Railroad's Patent (50-2000-0018) may have exclusive license restrictions on development limited to transportation, communication and transmission purposes. The *Chugiak-Eagle River Comprehensive Plan* designates Tract C as transportation facility lands.

Tract B, previously thought of as most likely as lower density residential extension of the Powder Reserve community[15], is now anticipated by Eklutna, Inc., to develop partly as a low-intensity industrial use area. This study assumes that such development may occur within the 20-year planning horizon. Eklutna, Inc., is a party to the 2012 National Defense Authorization Act authorizing a three-party conveyance between the Municipality, JBER, and Eklutna, Inc. The land exchange is under consideration or in process of negotiation. Under the potential agreement, use of Tract B areas located west of the Alaska Railroad Corridor would be subject to non-residential development restrictions and may be limited to low intensity uses in general that are compatible with JBER operations on its adjacent training lands. Eklutna would receive the JBER Boniface site in exchange (see JBER discussion). Further consultation with Eklutna, Inc., in early 2015 clarified the following with respect to Tract B:

1. Most of Track B east of the Railroad Corridor is anticipated by Eklutna, Inc., to develop as primarily residential, although with some industrial activity likely within a 25-acre excavated area fronting along the railroad tracks. Eklutna has a snow disposal site there now, and this development area enables access further south. As provided in the *Chugiak-Eagle River Comprehensive Plan*, a part of this low-lying area may, alternatively, be eventually urbanized with a commuter railroad station serving Powder Reserve and Eagle River generally.

2. On Tract B west of the Railroad Corridor, the uses are anticipated to be light industrial in scope in context of a JBER land exchange agreement. In consideration of possible buffering for the military base training lands and deduction of Class A Wetlands, municipal planners estimate 70-90 acres of buildable land supply could become available in Tract B west of the Railroad Corridor. Some residential has been considered by Eklutna, Inc.; however, it is likely that JBER would prefer Tract B not be developed as residential. If the three-party land exchange occurs, JBER may wish to impose limited industrial type uses on the west side of the tracks, and perhaps the remainder of Tract B also as part of the transaction/exchange conditions.

3. Road access to the west side would require a new railroad crossing. This study assumes that such access is possible to develop within the planning horizon. An amendment to the *Chugiak-Eagle River Comprehensive Plan* and a rezoning would also be necessary to move Tract B out of development holding reserve classification status and into active use.

[15] Anchorage Housing Market Analysis (2012)

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Municipality of Anchorage
Anchorage Industrial Lands Assessment

Net Supply of Buildable Industrial Land

Eagle River and Powder Reserve Subareas

- Unconstrained Land
- Partially Constrained Land
- Significantly Constrained Land
- Redevelopable land where site FAR < 0.10 and BLVR < 0.75
- Parcels 1 acre or larger in size
- Lands partially or significantly constrained only due to no water and/or wastewater service.
- Subarea Boundary
- Zoning Boundary

Imagery: 2012 Pictometry and 2010 Orthophoto

N

0 500 1,000 2,000 Feet

Joint Base Elmendorf-Richardson

Clunie Lake

Powder Reserve Tract B (Eklutna Inc.)

Powder Reserve Tract B (Eklutna Inc.)

Powder Reserve Tract C (Alaska Railroad)

Powder Reserve Tract A

Artillery Road Area

Hiland Mountain Correctional Center

HLB #1-085

Eagle River High School

Anchorage Regional Landfill

Glenn Highway

Old Glenn Highway

North Eagle River Loop Road

Business Boulevard

Spring Brook Dr

Eagle River Road

Hiland Road

Map 36

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Chugiak Subarea including Eklutna 770 Tract

Net buildable, available supply of Tier 2 industrial-zoned land: 6.3 acres

Additional supply of Tier 2 PC zoned industrial land: 56.3 acres

The Chugiak subarea has a net buildable supply of 6.3 acres of Tier 2 industrial zoned (I-1) land, after factoring partial and significant site constraints as well as the historical commercial utilization rate of 5.5 percent in Chugiak-Eagle River (Table 28). This land base is mostly comprised of a few partially vacant, small- to medium-size parcels along the eastern side of the Old Glenn Highway.

Most of the industrial potential in the Chugiak subarea lies in the PC (Planned Community) zoned Eklutna 770 Tract and two gravel extraction sites also zoned PC along the Old Glenn Highway. The northernmost gravel extraction site, Chugiak Pit, is in the process of being replatted into seven lots for commercial-industrial use. The second gravel extraction site, approximately 25 acres across the Old Glenn Highway from the 770 Tract, is currently an active rock quarry. Consultation with an area property and business owner indicated that this site is likely to become available for industrial redevelopment within the planning horizon. Including this particular site is intended to illustrate the potential future reuse of gravel extraction sites along the Old Glenn Highway, some of which may (or may not) become available within the 20-year horizon.

Map 37 depicts the net buildable land supply in the Chugiak subarea including the 770 Tract. This subarea is not anticipated to receive water or wastewater service within the planning horizon, so all of it is included in Tier 2.

Eklutna 770 Tract

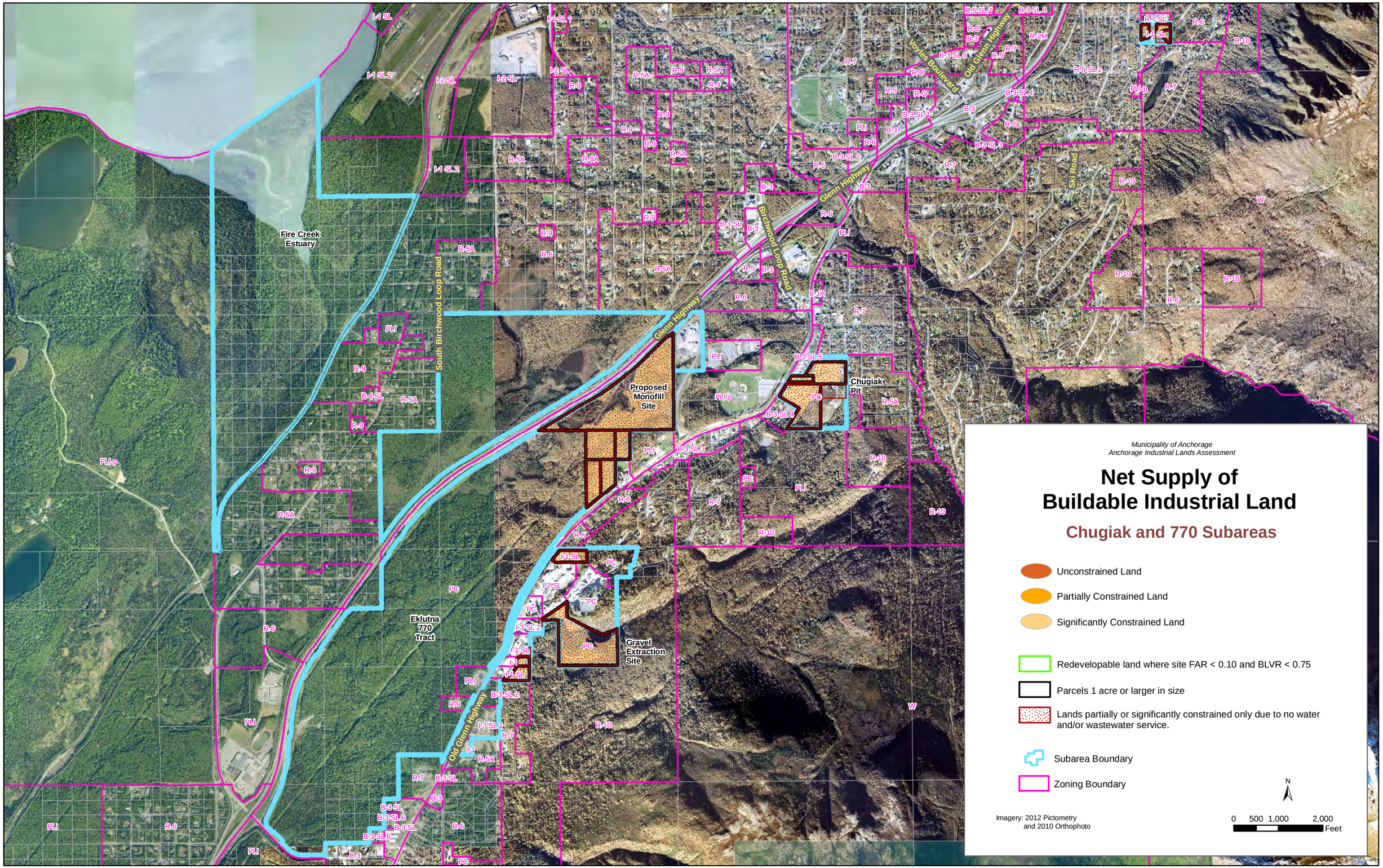
Eklutna, Inc., is the largest single private landowner in Anchorage, owning some 90,000 acres within the Municipality, including the communities of Eagle River, Birchwood, Chugiak, Peters Creek, and Eklutna. Its landholdings include some of the largest remaining tracts of potential commercial, industrial and residential real estate within the Municipality.

Among these holdings, Eklutna, Inc., has set aside an additional 770 acres, located between the New and Old Glenn Highways in Chugiak, primarily for future residential development. The "Eklutna 770," as it is commonly referred, is classified in the Comprehensive Plan as "Residential" at an overall average density of 1 to 2 dwellings per acre. The designation allows for different housing types and lot sizes within different portions of this property, and for a portion of the 770 to be used for commercial and industrial uses. The exact size and location of commercial and industrial uses are to be determined through area-specific master planning. Development of the Eklutna 770 is anticipated to occur gradually, over a timeframe extending beyond the planning horizon for this study.

The potential future supply of industrial land on the 770 is elastic and will depend on future market trends, area-specific master planning and suitability analyses, and community policy choices. As of this writing, Eklutna is seeking

master plan approval to develop a portion of the north set of parcels in Tract 770 as industrial, commercial and possibly residential areas, adjacent to the municipal road maintenance facility area abutting the north boundary of the 770. Uses under consideration include an inert waste monofill landfill type of solid waste management facility, and a separate industrial development area of approximately 10 acres in size. Eklutna believes that in the long term, once the proposed monofill site is reclaimed, it would be a positive addition to the municipal Loretta French Park located north of the 770.

This Industrial Lands Inventory assumes that approximately 50 acres in the northern portion of the 770 (after factoring in the significant constraints to development) could be available for industrial use within the planning horizon. This includes the area currently subject to Eklutna's proposed master plan, as well as several additional tracts to the south not specifically proposed for industrial use at this time. Adding this amount in addition to the existing proposed master plan illustrates the further potential of the 770 Tract to provide industrial lots. It also seems to be generally consistent with an upper-end range of the commercial-industrial lands envisioned for the 770 Tract in the *Chugiak–Eagle River Comprehensive Plan*. Even more aggressive scenarios for development of 770 lands could concurrently occur along the western side of the Old Glenn Highway, across from the existing industrial uses. However, the more aggressive industrial scenarios would probably require an amendment to the *Chugiak-Eagle River Comprehensive Plan* to reflect an increasing ratio of industrial use relative to the planned average density of residential development through the 770 Tract.



Municipality of Anchorage
Anchorage Industrial Lands Assessment

Net Supply of Buildable Industrial Land

Chugiak and 770 Subareas

- Unconstrained Land
- Partially Constrained Land
- Significantly Constrained Land

- Redevelopable land where site FAR < 0.10 and BLVR < 0.75
- Parcels 1 acre or larger in size
- Lands partially or significantly constrained only due to no water and/or wastewater service.

- Subarea Boundary
- Zoning Boundary

N

Imagery: 2012 Pictometry and 2010 Orthophoto

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Birchwood Airport Subarea

Net buildable, available supply of Tier 2 industrial-zoned land: 88.5 acres

Additional potential supply in two R-6 zoned parcels south of airport: 35.0 acres

The Birchwood Airport Subarea is located 24 miles from Downtown Anchorage, and just under that distance from Palmer and Wasilla. It is 1.6 miles from the Glenn Highway and is accessible by Birchwood Loop Road. One of the most significant cluster of parcels available for industrial development in Chugiak-Eagle River is located adjacent to the Birchwood Airport.

The Birchwood Airport subarea's net buildable supply is 88.7 acres of industrial-zoned land, after factoring the lack of sewer service as a significant constraint and the historical commercial utilization rate of 5.5 percent in Chugiak-Eagle River. The development capacity estimate without factoring the lack of sewer service would otherwise have been closer to 170 acres, as the land is developable uplands with few known environmental constraints.

Map 38 depicts the net buildable land supply in the Birchwood Airport subarea.

The Municipality is in the process of establishing a law enforcement training center on the undeveloped tract of Eklutna land located south of the Ames Izaak Walton League shooting range facility, just north of Birchwood Airport.

A pair of R-6 zoned parcels adjoining the south end of the Airport area, that are isolated from the Birchwood residential neighborhood by the Birchwood Industrial Park and Fire Creek Estuary conservation easement lands, could be converted to industrial zoning and make additional lands available equal to 35.0 acres when considering the significant constraints to development (lack of sewer). The acreage figure, without considering the lack of sewer service, would otherwise be closer to 70 acres in these two parcels.

Lands located further southwest of Birchwood Airport, including the Fire Creek estuary and uplands on the west side of the estuary abutting Beach Lake Regional Park, have been dedicated as a permanent conservation easement, and are not be available for industrial development.

Eklutna, Inc., recently established three permanent conservation easements over most of its coastlands and some adjacent coastal uplands, including areas to the north and south of the Birchwood Airport area. The easements are extensive in area. They include 520 acres of Eklutna lands in the Fire Creek estuary south of Birchwood Airport runway out to Beach Lake Regional Park. The conservation easements also include coastal lands extending from the mouth of Peters Creek to the mouth of Eklutna River and continuing to the northwestern part of Eklutna Village vicinity.

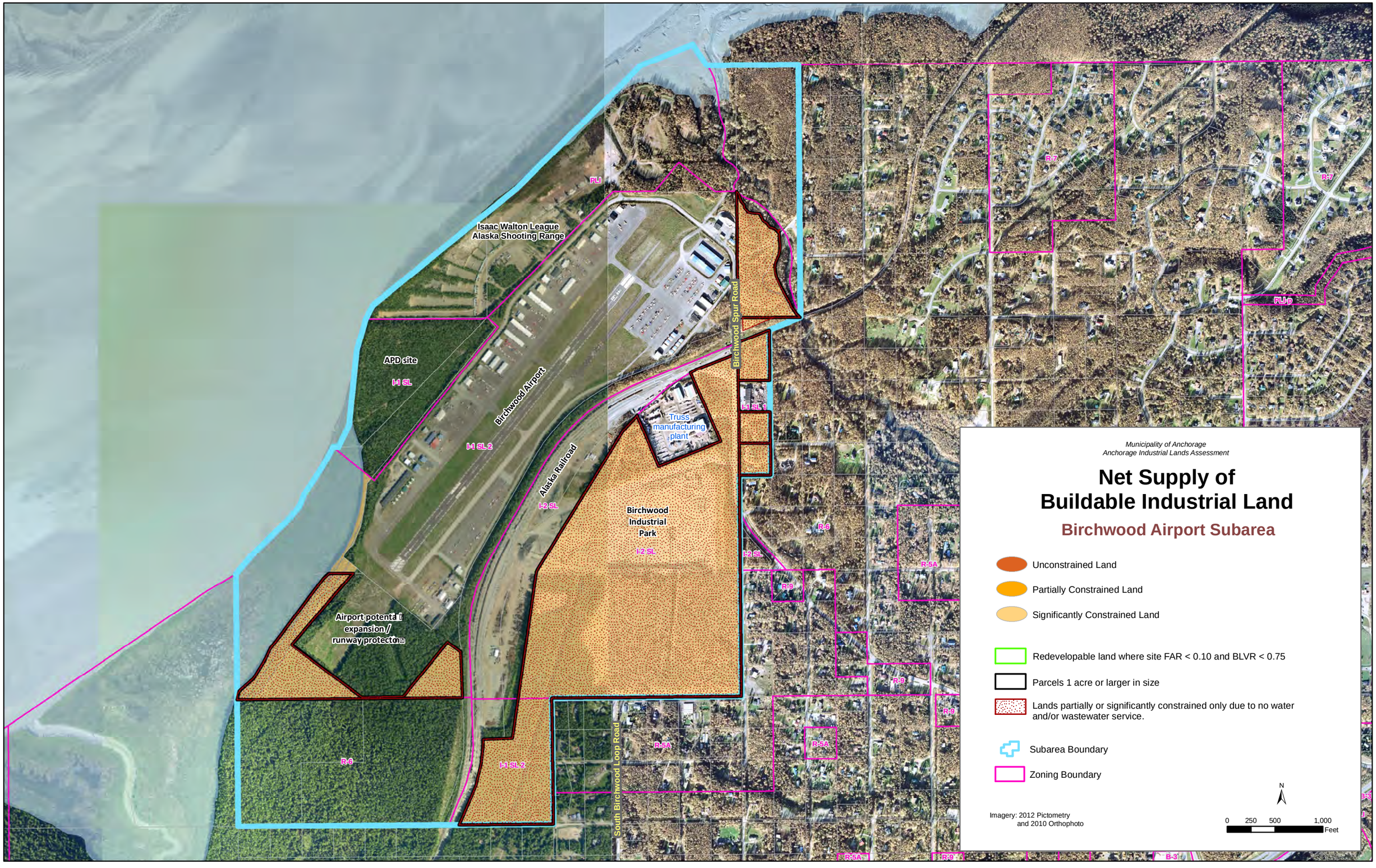
Birchwood Industrial Park

The Alaska Railroad in partnership with Eklutna, Inc., is jointly marketing the Birchwood Industrial Park, zoned I-2 SL, as the largest newly developed industrial zoning district property within the Municipality. Lands in the Birchwood Industrial Park are available for long-term lease, and will accommodate a wide range of parcel sizes depending on the needs of the user (lessee). Approximately 160 acres of land area have been cleared, quarried, and graded for industrial development. The partners are targeting corporations that may use the site as a construction materials laydown yard for anticipated energy development and other Alaska projects.

The industrial park property is adjacent to the Alaska Railroad corridor, the Alaska Railroad's satellite rail yard, and Birchwood Airport. A settlement agreement between the Alaska Railroad and Eklutna, Inc., dating from 1985 when the Railroad was transferred from federal to state ownership, established that the Railroad would provide certain accommodations, such as the Railroad Spur into the Birchwood Industrial Park and a ground-- -separated crossing at Powder Reserve. An established rail spur is in place and ready for use by future Birchwood Industrial Park businesses.

The area is served by natural gas, electricity, and telephone utilities. It is not anticipated to be serviced by municipal water or wastewater utilities in the planning horizon.

The three Eklutna, Inc., parcels south of the Birchwood Airport runway and comprising approximately 130 acres of land area are also buildable and accessible. Two are the R-6 parcels introduced above. Most of the third is reserved for the Birchwood Airport APZ. These have not been cleared or quarried, and rezoning would be necessary to convert the R-6 parcels. However, this study assumes that these parcels could become available as part of the industrial land base within the 20-year planning horizon.



Municipality of Anchorage
Anchorage Industrial Lands Assessment

Net Supply of Buildable Industrial Land

Birchwood Airport Subarea

- Unconstrained Land
- Partially Constrained Land
- Significantly Constrained Land

- Redevelopable land where site FAR < 0.10 and BLVR < 0.75
- Parcels 1 acre or larger in size
- Lands partially or significantly constrained only due to no water and/or wastewater service.

- Subarea Boundary
- Zoning Boundary

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Imagery: 2012 Pictometry and 2010 Orthophoto

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Northern Eklutna Subarea

Net buildable, available supply of Tier 2 industrial-zoned land: 49.3 acres

Additional supply in T zoned lands: 10.9 acres

The northern Eklutna subarea comprises three vast, distinct land areas that the Industrial Lands Inventory delineates as Mirror Lake Reserve Lands; Eklutna Village Area, and Eklutna Power Plant Industrial Area. However, the net buildable supply is equivalent to only 49.4 acres of Tier 2 and 3 industrially zoned land, after deducting the substantial areas of prohibitively constrained lands, factoring partial and significant site constraints (primarily a lack of sewer service which reduced development capacity by 50 percent), and carrying forward the commercial utilization rate of 5.5 percent in Chugiak-Eagle River. The area calculation without considering the lack of sewer service would otherwise have been closer to 100 acres. An additional 10.9 acres is estimated to be available in T zoned lands located south of the new power plant. In fact, the entire available supply is located in the Eklutna Power Plant Industrial Area portion of the subarea, as shown on Map 39. A description of each of the three parts of the northern Eklutna subarea follows.

Mirror Lake Reserve Lands

The vast landholdings of Eklunta, Inc., located west and north of Mirror Lake, on the west side of the Glenn Highway, could be physically developable were the Municipality and Eklunta, Inc., to prioritize its access and development within the planning horizon. The Mirror Lake Reserve Lands represent the largest reserve of potentially developable lands in the Municipality.

The area is currently zoned Transition (T), and is not designated for a specific future use. While some tracts could develop as industrial, most could be used for residential and some commercial purposes. Areas to be urbanized may also be quarried for gravel for years as an initial use, prior to improvement for urban development.

Road access to the Mirror Lake Reserve Lands would likely be provided by a freeway interchange near Mirror Lake, and there are easements in place for a major thoroughfare into this large area. Besides site specific environmental constraints such as riparian areas, there are no other prohibitive obstacles to urban development of this subarea within a longer term planning horizon, with the exception of utilities infrastructure.

However, improvements to provide access into this area are not identified as priority projects in the *Metropolitan Transportation Plan* (MTP). The *Official Streets and Highways Plan* designates the area for a special study to be conducted in the long term to determine the most appropriate means of ultimately providing access, as a prerequisite to the area's development. The MTP does not indicate a timeframe for that sequence.

In addition, current forecasts for the rate of population growth and urban development in the Municipality, including Chugiak-Eagle River, do not support an argument that these areas would undergo urban development within the next 20 years. Instead, current trends suggest they are more likely to remain in reserve until sometime after the 2035 planning horizon. Consultations with Eklutna, Inc., indicate that Eklutna would prefer geographically phased and efficient urban-density development over multiple generations. Given the current and projected growth rates for the Municipality, the geographic extent of urbanization within the 20-year planning horizon is likely to be limited to Powder Reserve Tract A and portions of the Eklutna 770 Tract. Substantial investments in infrastructure such as sewer service will be necessary to finish building Tract A and initiate development in the 770 Tract.

For these reasons, the Industrial Lands Inventory does not assume the Mirror Lake Reserve Lands will be available for industrial development, at least under the current trend growth scenarios and policies. While trends can change, the information available suggests it is prudent for the Municipality to avoid assuming the availability of these lands as part of the industrial land supply to satisfy industrial land demand through 2035.

Village of Eklutna Area

The Village of Eklutna area, which includes all lands generally adjacent to and north of the Eklutna River on the northwest side of the Glenn Highway, is not anticipated to accommodate future industrial development. Resource extraction did occur historically, on a geologic granite foundation that is highly valued by the Eklutna Tribe. However, all lands in this area have been returned to ownership by Eklutna. Consultation with Eklutna, Inc., indicates that the Eklutna Tribal Council intends to reserve most upland areas north of the Railroad Corridor in the area north of Eklutna Village as a place for recreation, hunting, fishing, and natural open space between the Village and the Inlet and Eklutna River estuary area. Other parts are included in coastal and estuary conservation easements. The Village of Eklutna area is planned as the place to keep alive traditional lifestyles and recreation accessible to generations of Tribal members even after much of the rest of the Chugiak-Eagle River area is urbanized.

To recognize and support this objective, the Eklutna Village Overlay District has recently been adopted as a part of the municipal zoning regulations. This overlay zone is to provide for a traditional lifestyle intergenerational family housing pattern. Although limited non-residential uses are permitted, the Eklutna Village Overlay District is not intended to be available for any substantial industrial development.

Eklutna Power Plant Industrial Area

This area is located along the south side of the Glenn Highway and Alaska Railroad Utility Corridor across from Eklutna Village. The site of the new Eklutna Power Plant developed by the Matanuska Energy Association (MEA) is in the eastern part of the area. The Eklutna Power Plant industrial area represents one of the largest cluster of developable industrial parcels in Chugiak-Eagle River.

An amendment to the *Chugiak-Eagle River Comprehensive Plan* modified the community's Land Use Plan map in 2013, by changing the land use classifications for this area from "Commercial" and "Residential" to "Industrial" and "Community Facility." This Plan map amendment reflects several rezonings to industrial use that have occurred in the area since 2006, as well as the site plan for the new Eklutna Power Plant.

Most of the rezoning and plan amendment area consists of vacant or underutilized lands, and, therefore, represents another potential industrial area in addition to Birchwood Industrial Park.

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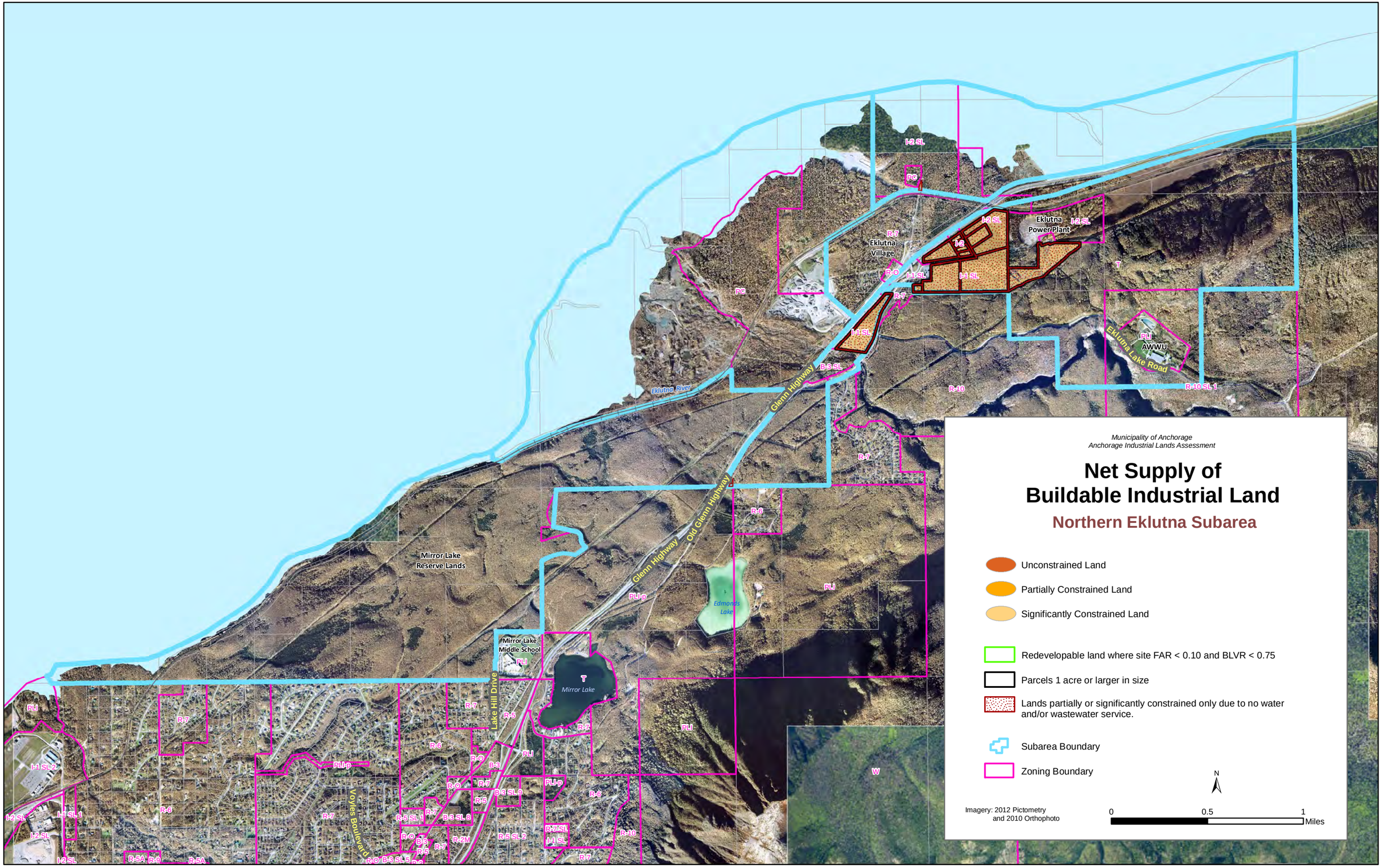
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PC
R-7
Eklutna Village
I-2
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Eklutna Power Plant
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I-1 SL
T
PC
R-7
I-1 SL
Eklutna Lake Road
PLI
AWWU
B-3 SL
Glenn Highway
Eklutna River
R-10
R-10 SL 1
R-7
Old Glenn Highway
R-6
Mirror Lake Reserve Lands
PLI-p
Edmonds Lake
PLI
Mirror Lake Middle School
PLI
T
Mirror Lake
Lake Hill Drive
R-7
R-6
R-7
PLI
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R-7
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R-5
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PLI-p
Voyles Boulevard
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R-5 SL 1
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Subarea Boundary
Zoning Boundary
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Imagery: 2012 Pictometry and 2010 Orthophoto
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