

5. *INDUSTRIAL LAND SUPPLY ANALYSIS*

Methodology

The EPS team used a GIS/CAMA-Based Inventory of Industrial Land supply, combined with direct field observation, satellite imagery, and interviews to analyze I-1 and I-2, I-3, and MI zoned properties in Anchorage, Eagle River, and Chugiak-Eklutna. The Study Area boundary is shown in **Figure 1** in **Chapter 2**.

As described in the technical appendix, the EPS team worked with MOA staff to prepare map layers describing various parcel, land, and context characteristics. These were used in combination with MOA CAMA tables, documentation and data to prepare specific parcel information for the industrial zoned parcels.

Direct field observation took place through a windshield survey over the course of several days examining general industrial use and development characteristics as well as identifying anomalies between the GIS/CAMA-Based Inventory and actual site development. It also identified the extent of non-industrial development in industrial zoned properties.

During the inventory and supply analysis, the EPS team prepared and made use of extensive parcel overlays and other context factors available through Google Earth. Together, these layers allowed the team to evaluate anomalies in GIS/CAMA data in relation to actual physical use of sites, identify patterns of industrial development, and relate the analysis to specific Subareas.

Interviews were conducted with major industrial land development organizations including the Port of Anchorage, the Alaska Railroad Corporation, the International Airport, the University of Alaska-Anchorage, the Eklutna Corporation, CIRI, the Heritage Land Bank, the MOA, industrial land brokers, and numerous industrial companies, to further characterize the industrial land supply.

Sensitivity Analysis

The EPS Team then compared with direct field and satellite observation multiple anomalies appear in the undeveloped and vacant parcel quantities. The EPS team observed three particular anomalies:

- Land listed as vacant, but because of regulatory status, such as a wetland designation, is undevelopable.
- On observation, land designated as vacant does not necessarily mean empty. Many parcels designated vacant show some type of yard or storage activity.
- No recorded assessment does not mean without construction or use.

In particular, parcels without minimum vertical improvements or assessed value occur primarily in parcels used for yard, storage, or laydown space, or in parcels that were being used by adjacent developed parcels. In a few cases, new development had not yet been characterized,

or was temporary in nature. To establish a fully accurate understanding of undeveloped parcels, eliminating those which appear to be undeveloped but are in use, a comprehensive field survey of individual anomalous properties is necessary. To correct for inaccuracies caused by these anomalies, satellite observation on parcels of 0.5 acres or larger was used to adjust overall supply.

Overall Context

Historical Industrial Development Pattern

From its early beginnings as a camp and supply terminal port for construction of the Alaska Railroad, Anchorage's development pattern focused significant and strategic land assets on industrial development. 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.

Evidence of historic population trends in Anchorage indicate that two significant events led to population increases of over 200 percent during the 1940s and the 1970s. The first, establishment of Elmendorf Air Force Base and Fort Richardson in 1940 responding to the increased Pacific threats in WWII, caused the census documented population to increase from fewer than 3,500 in 1940 to more than 11,250 in 1950.

The Port of Anchorage, established initially to support rail construction, experienced predictable, incremental growth for nearly 50 years. The Port at Seward was also a major contributor to the movement of goods and people during the early part of the century. However, relocation of the railroad headquarters to Anchorage, perhaps in response to Chickaloon coal extraction for the Navy, and the flooding of Seward in 1917 had already solidified the Port of Anchorage as the primary logistics center for Alaska. As WWI 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.

As demand for air cargo rapidly grew in the mid-20th century as a result of Anchorage's location advantage as a primary supply center, Merrill Field's ability to meet 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 logistic 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. Historical accounts indicate Anchorage's building supply also suffered significant damage; however, the Port of Anchorage was able to resume operations within a short period of time. During the subsequent period of reconstruction, census data indicates that the population increased very little in the years following the earthquake, and few industrial parcels were developed until the construction of the Trans Alaska Pipeline began in 1975. Following the discovery in Prudhoe Bay in 1968, getting Alaskan oil to market became an American imperative. Getting goods and people to construction sites was enhanced through the completion of the Park Highway from Palmer to Fairbanks in 1971.

While industries such as mining, fishing, fur, and timber helped sustain incremental growth for industrial land 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, construction projects around Alaska sponsored by the federal government were the primary source of demand for industrial land in the Anchorage area.

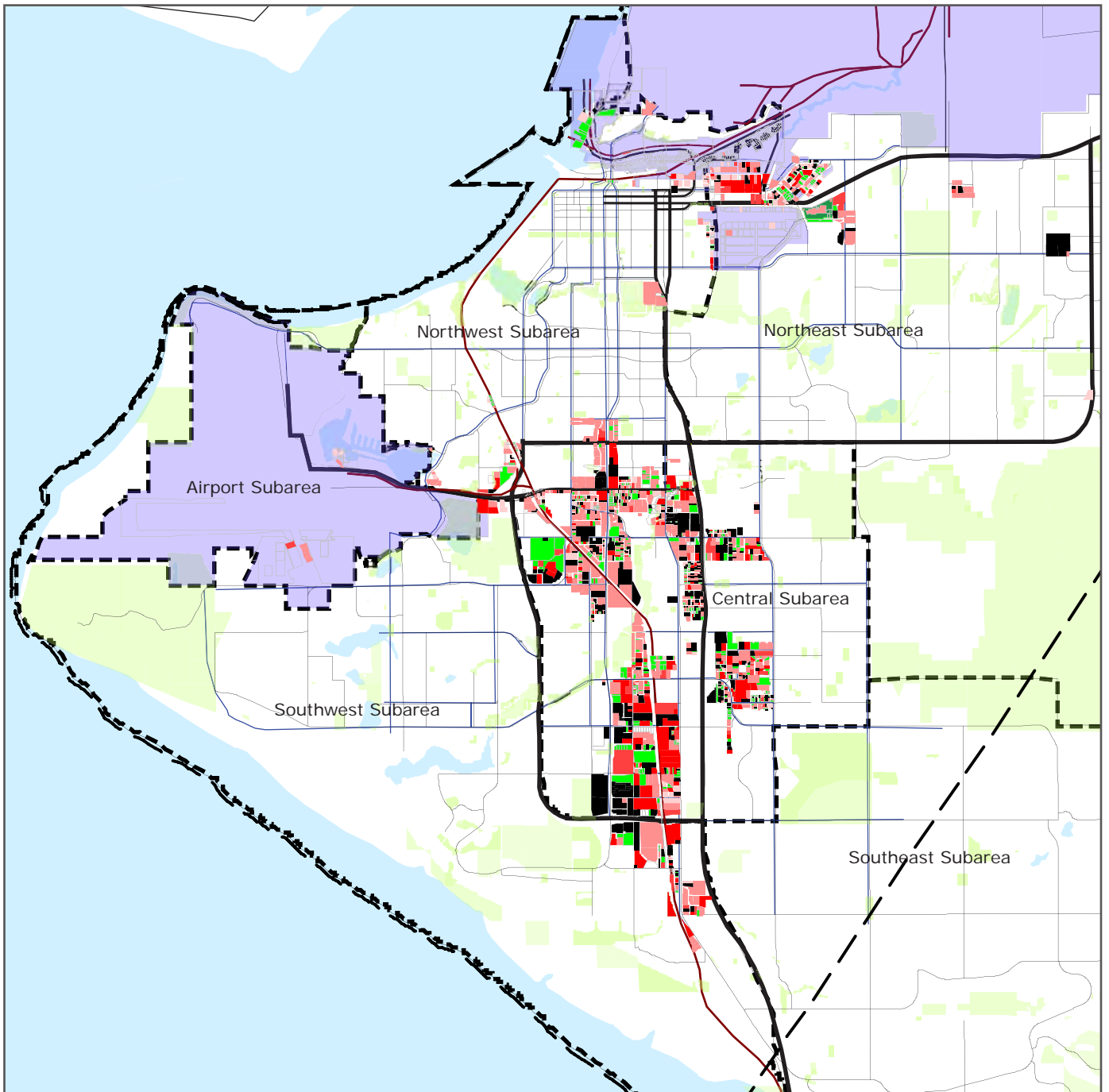
During the years from 1974 through 1977, a rapid influx of contractors, subcontractors, and materials led to extensive industrial development, particularly in the Northwest and Central Subareas. MOA data suggests that nearly 300 industrial parcels were built out during the period from 1975 to 1980, compared to 266 industrial parcels developed between 1942 and 1975. The data indicates that industrial development continued at a healthy pace over the next decade with approximately 536 industrial parcels developed between 1980 and 1989. This compares to 133 parcels in the 1990s and 256 parcels in the past decade.

Today, the Anchorage industrial land and facility supply supports nearly all sectors of the economy to some extent. Manufacturing and fabrication facilities are primarily limited to support of infrastructure, oil field and pipeline needs, while logistics, storage and construction laydown yard supply is extensive. This relationship of fewer manufacturing uses to more logistic uses lowers the industrial building floor area to site ratios for the overall bowl creating increased land area demands.

Moreover, observations of many recently developed industrial parcels in the I-1 and I-2 zones indicate a significant shift in use from industrial uses to commercial, retail, and other non-industrial uses. **Figures 13** and **14** illustrate the historical industrial development patterns in the MOA over four key time periods: (a) from 1942 through 1970, (b) 1971 through 1989, (c) 1990 through 1999, and (d) 2000 through 2008. While currently undeveloped parcels are shown in black, developed land is shown in gradations of red, with the lighter shades being developed earlier in the MOA's history, and the darker being the most recently developed. **Tables 12** and **13** show the corresponding industrial absorption from 1970 to the present in tabular form.¹⁷

¹⁷ Please note that these figures are based on the MOA's building permit database, and the industrial classifications presented therein may not match those presented elsewhere in this report.

Figure 13:
Development of Industrially Zoned Parcels 1942-2008, Anchorage Bowl



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Subarea Perimeter



Primary Double Load Routes



Railroad



Industrial Serving Arterials



Parcel Legend

Vacant Parcels



Developed 1942-1970



Developed 1970-1989



Developed 1990-1999



Developed 2000-2008



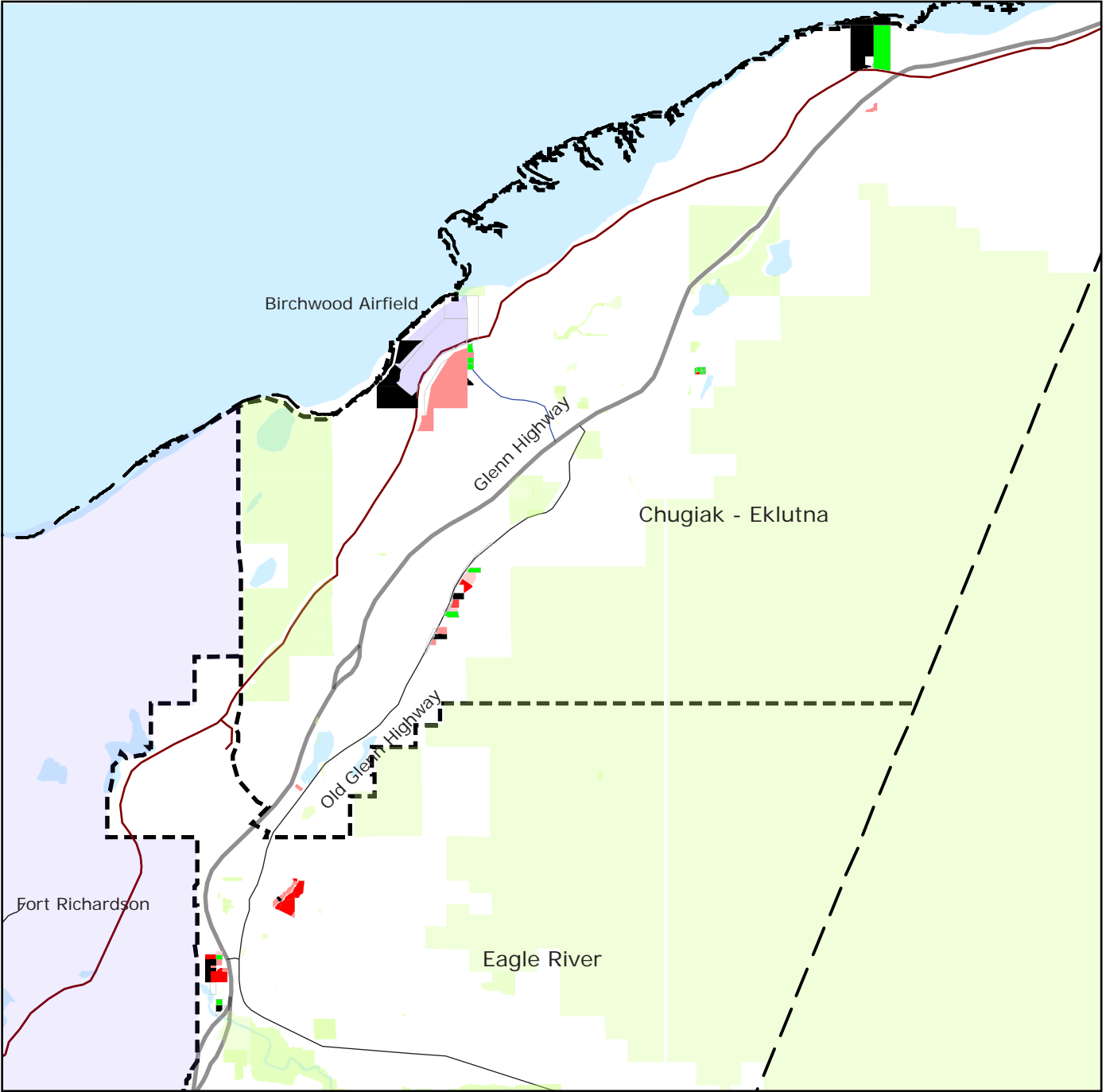
Developed-Undated



Public or Unsuitable



Figure 14:
Development of Industrially Zoned Parcels 1942-2008, Eagle River - Chugiak/Eklutna



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Subarea Perimeter



Primary Double Load Routes



Railroad



Industrial Serving Arterials



Parcel Legend

- Vacant Parcels
- Developed 1942-1970
- Developed 1970-1989
- Developed 1990-1999
- Developed 2000-2008
- Developed-Undated
- Public or Unsuitable



Table 12
Anchorage Bowl Industrial Land Assessment
Building Square Feet Constructed By Industrial Category

Category [1]	Before 1950	1950 - 1959	1960 - 1969	1970 - 1979	1980 - 1989	1990 - 1999	2000 - 2008	Total
Cold Storage	0	0	28,686	46,236	27,780	212,936	15,120	330,758
Warehouse/ Distribution	0	0	33,350	810,893	506,692	558,887	34,465	1,944,287
Lumber Storage	0	0	0	2,256	34,160	0	0	36,416
Manufacturing	134,152	6,926	329,073	506,741	586,684	338,175	233,714	2,135,465
Mini Warehouse	0	0	3,996	238,197	497,054	175,360	474,441	1,389,048
Prefab Warehouse	0	13,400	5,000	11,664	53,468	7,767	0	91,299
Warehouse	10,324	174,084	1,416,244	3,936,129	3,006,644	1,712,422	1,331,944	11,587,791
Total (Sq. Ft.)	144,476	194,410	1,816,349	5,552,116	4,712,482	3,005,547	2,089,684	17,515,064
Total (Acres) [2]	15.8	21.3	198.6	606.9	515.2	328.6	228.4	1,914.7
Average Annual (Sq. Ft.)	n/a	19,441	181,635	555,212	471,248	300,555	208,968	301,984
Average Annual (Acres) [2]		2.1	19.9	60.7	51.5	32.9	22.8	33.0

"sqft_hist"

Source: Municipality of Anchorage and EPS

[1] Does not include Office Warehouse.

[2] Assumes 21% Floor-Area-Ratio.

Table 13
Anchorage Bowl Industrial Land Assessment
Summary of I-1 and I-2 Land and Building Sq. Ft. Developed in MOA (1970 - 2008)

Item	1970 - 1979	1980 - 1989	1990 - 1999	2000 - 2008	Overall 1970 - 2008
Total Building Sq. Ft. Developed					
I-1	2,796,649	2,288,587	441,539	863,904	6,390,679
I-2	858,079	514,759	588,643	422,558	2,384,039
Combined	3,654,728	2,803,346	1,030,182	1,286,462	8,774,718
<i>Combined Average Annual</i>	<i>365,473</i>	<i>280,335</i>	<i>103,018</i>	<i>128,646</i>	<i>230,914</i>
Total Acres Developed					
I-1	184.7	191.3	43.6	105.2	524.8
I-2	184.0	85.3	75.3	67.7	412.4
Combined	368.7	276.6	118.9	173.0	937.2
<i>Combined Average Annual</i>	<i>36.9</i>	<i>27.7</i>	<i>11.9</i>	<i>17.3</i>	<i>24.7</i>
FAR					
I-1	0.35	0.27	0.23	0.19	0.28
I-2	0.11	0.14	0.18	0.14	0.13
Combined	0.23	0.23	0.20	0.17	0.21

"hist_acres"

Physical Characteristics

Industrial development throughout the Anchorage Bowl has followed general industrial trends in that development has occurred primarily on relatively flat sites adjacent to infrastructure, major road arterials and transportation modes. Two important physical constraints affect the ability to increase industrial supply over time and define structural development standards.

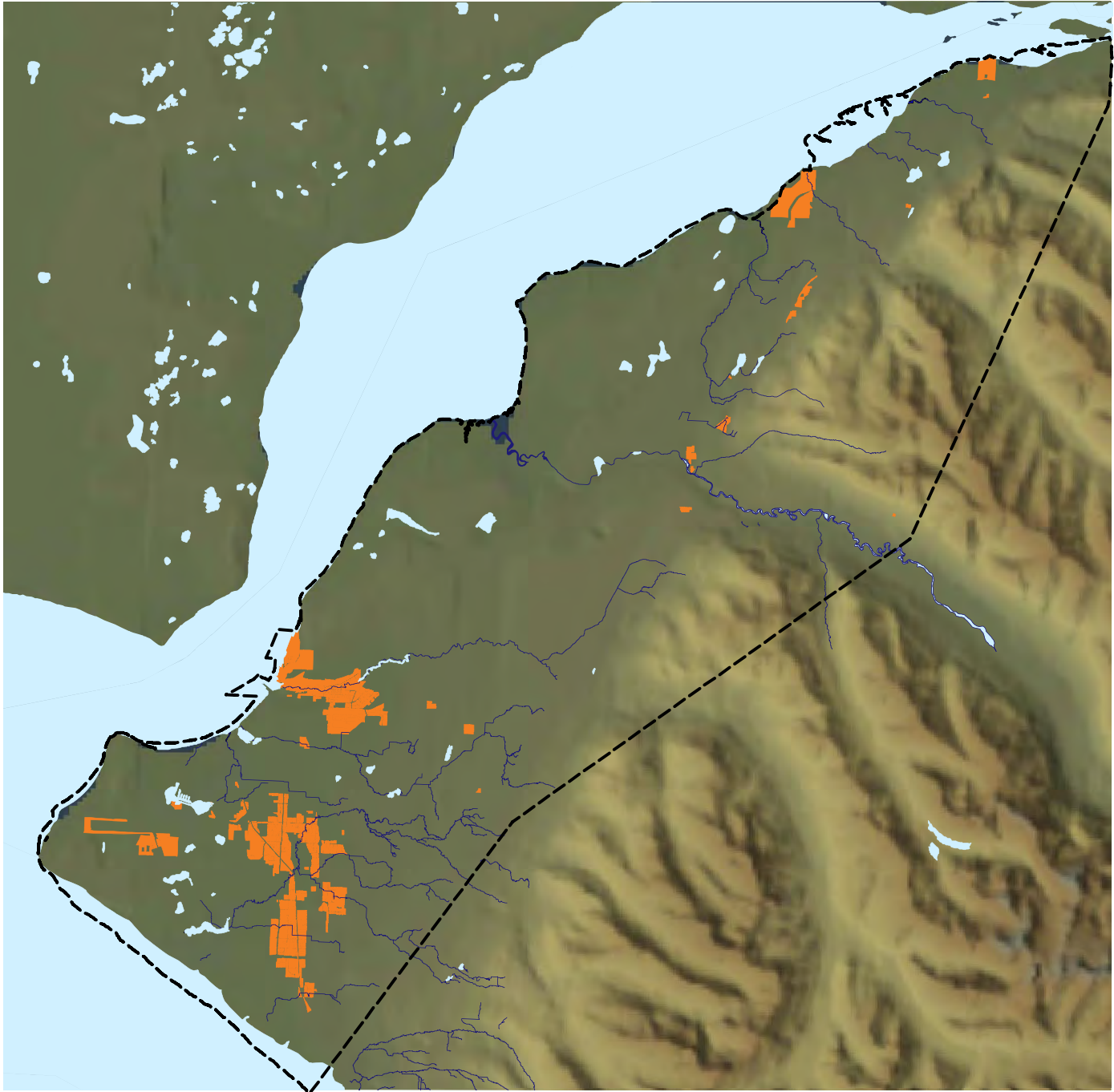
The first constraint is the character of the land itself. Bound between the mountains and the sea, development in the Anchorage Bowl has stretched to its physical boundaries. And while some large scale opportunities are present in Chugiak-Eklutna, the remaining opportunities are infill. Second, the bowl is home to numerous rivers, creeks, lagoons, lakes, and wetlands, which are integral to both environmental and community health. Industrial expansion into existing open space areas is neither practical nor desired by the community. In addition, existing industrial development has used most available sites, and those that remain typically have deep peat deposits that must be removed at great expense.

The extreme nature of seismic activity relative to the continuous subduction of the Pacific Plate under the North American Plate places industrial development sites in the bowl in moderate to high risk areas and is the second significant constraint. Structural system and foundation requirements contribute to increased development costs.

Moderate to severe winters also affect industrial development as large sites with yards, parking and dock areas must consider areas for snow removal and storage, as well as increased snow loading on structures.

Figures 15 through 19 show various characterizations of land in the MOA, and provide an overall sense of how industrial development relates to different land conditions. **Figure 15** displays the general topographic features of the Anchorage region, **Figure 16** shows streams, lakes, and wetlands, **Figure 17** shows open space, **Figure 18** displays the soil conditions of land, and **Figure 19** identifies the publicly-owned lands in Anchorage.

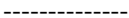
Figure 15:
Topography



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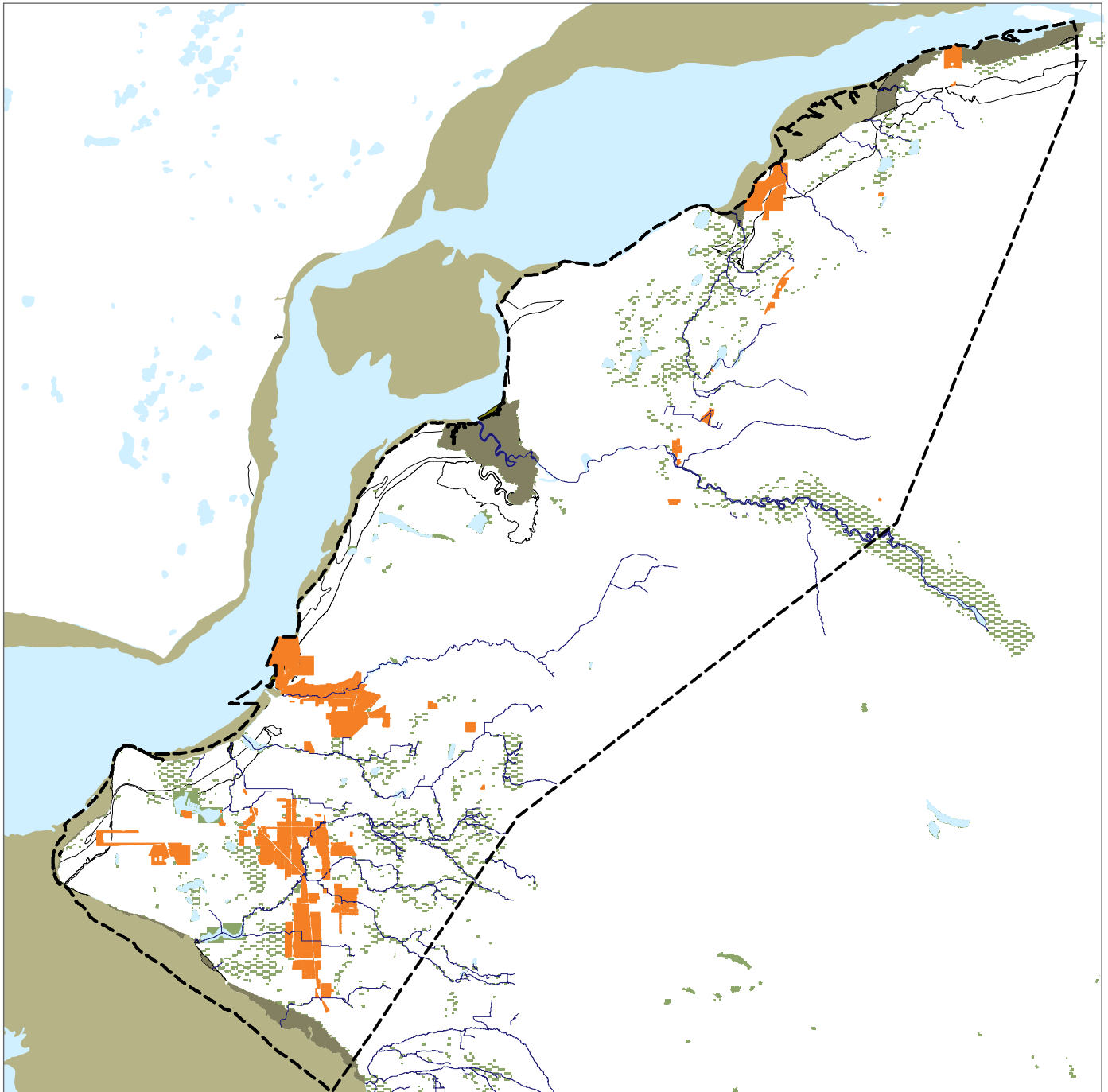
Streams



Industrial Parcels in MOA



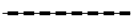
Figure 16:
Streams, Lakes and Wetlands



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Industrial Parcels in MOA



Coastal Wetlands



Tidal Flats



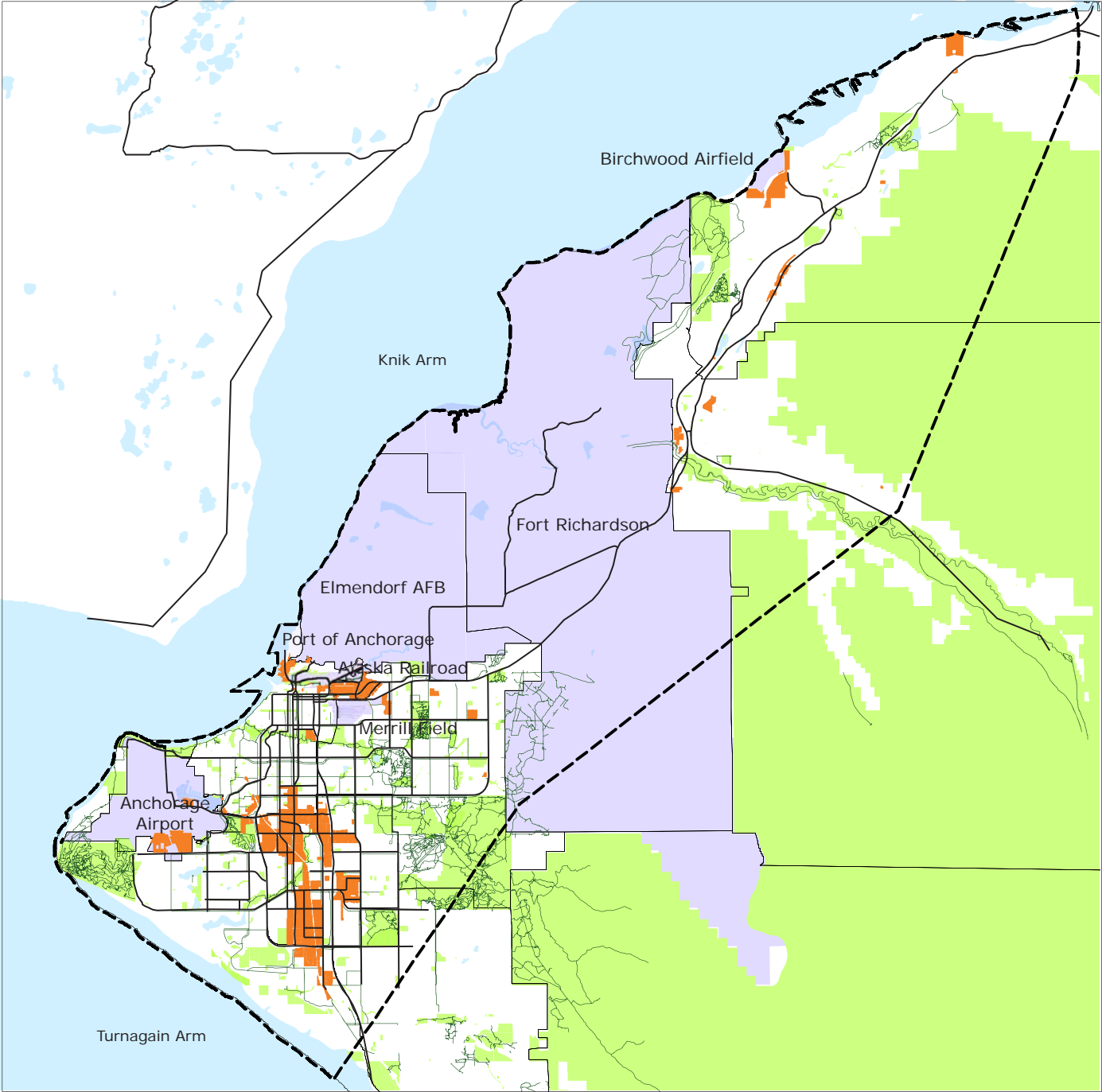
Wetlands



Streams



Figure 17:
Open Space



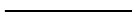
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Roads



Open Space



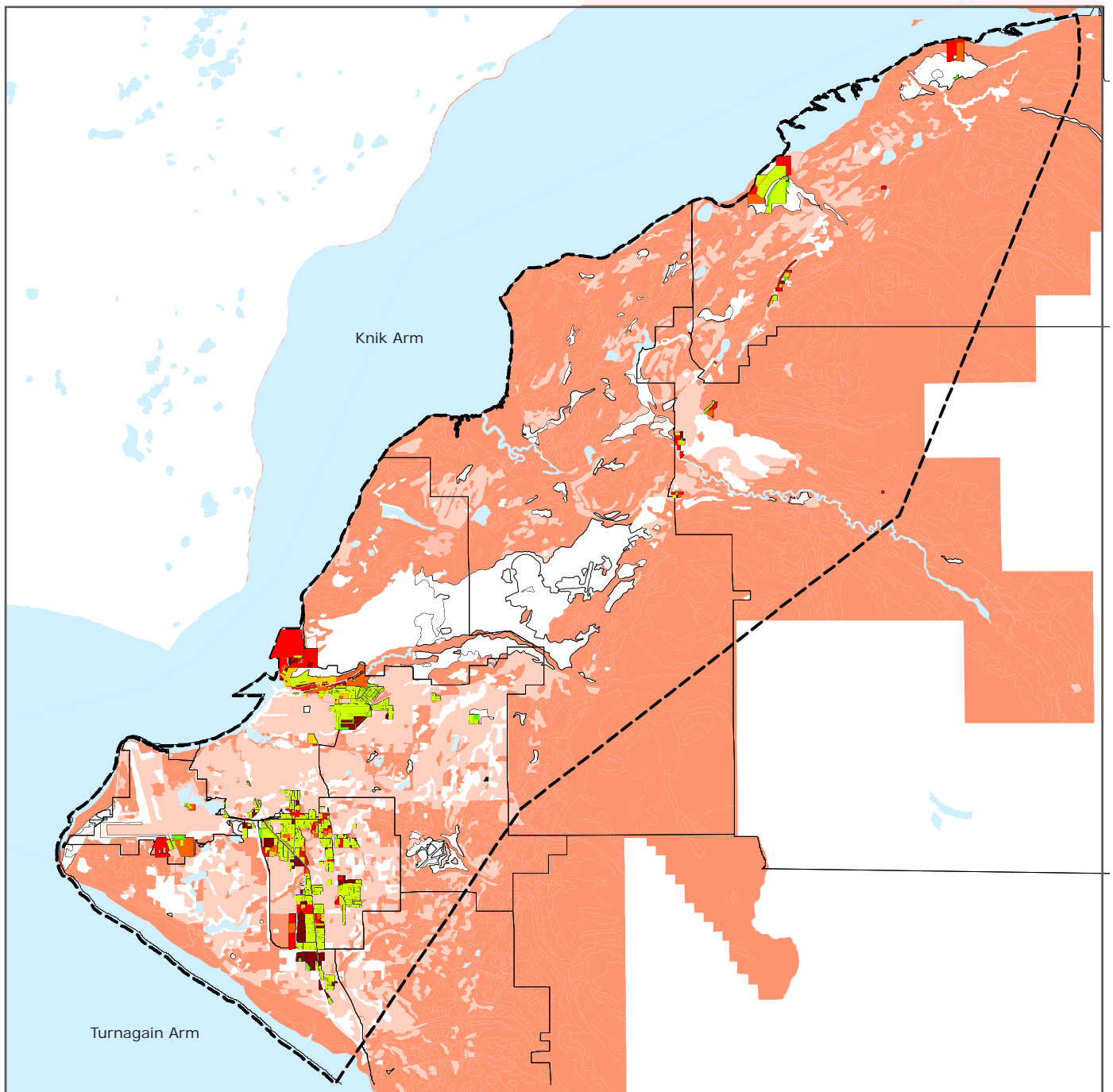
Industrial Parcels in MOA



Public Owned Lands



Figure 18:
Soil Conditions



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Industrial Parcel Limitations

0.51 to 1.00 - Very Severe
 -.26 to 0.50 - Severe
 0.11 to 0.25 - Moderate
 0.01 to 0.10 - Some
 0 (Zero) - Not Limited
 Less Than 0 - Not Rated

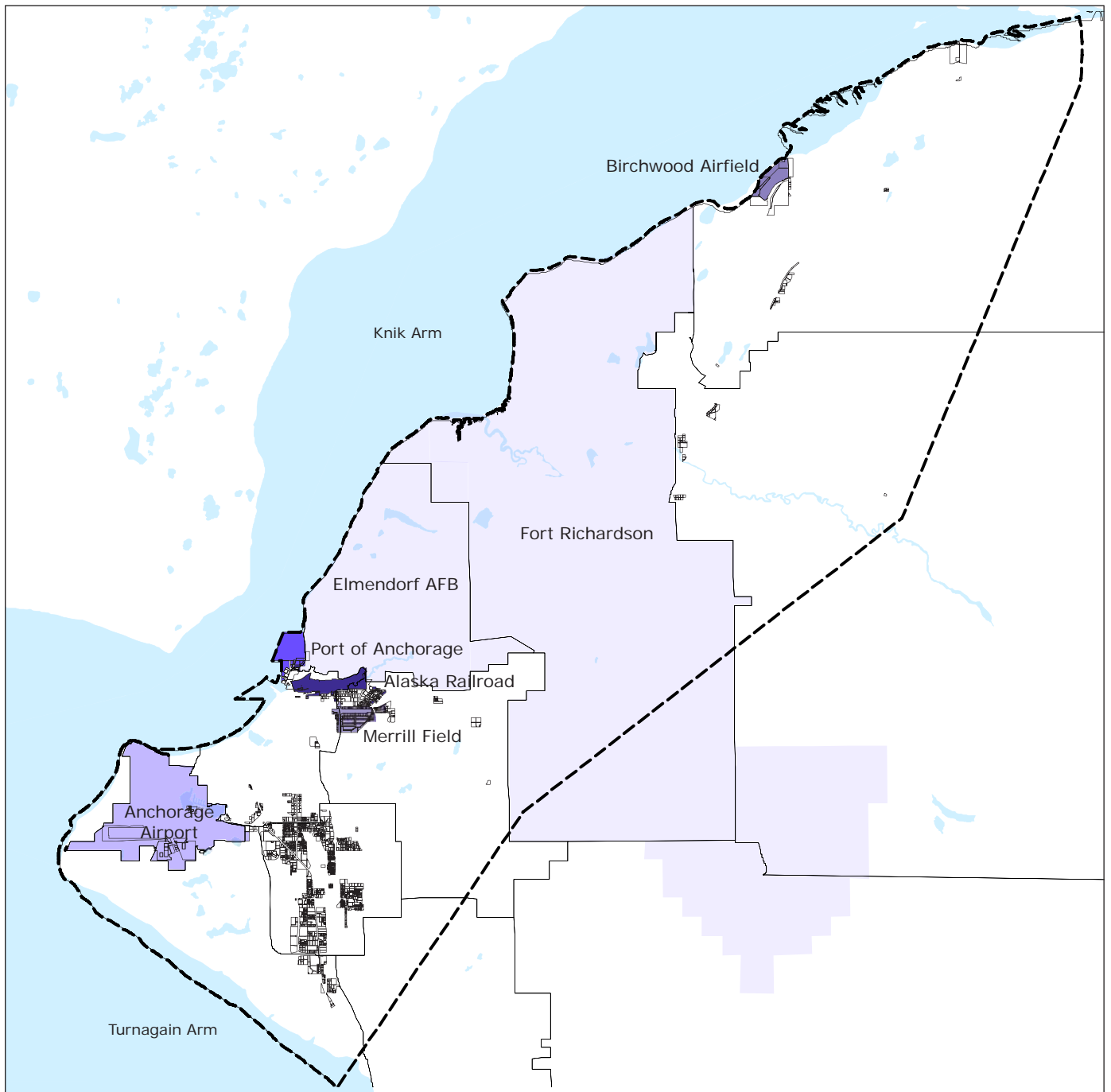


Other Parcel Limitations

More Severe
 Less Severe
 Not Rated



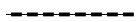
Figure 19:
Public Owned Lands



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Anchorage Airport



Port of Anchorage



Alaska Railroad



Military



Airfields



Anchorage Bowl Comprehensive Plan (Anchorage 2020) Goals

As a result of the merger between the MOA and the Greater Anchorage Borough, the MOA was created as a unified local government. In the MOA, two comprehensive plans identify long term community goals and govern the land use decisions; The Anchorage 2020 Comprehensive Plan, and the Chugiak-Eagle River Comprehensive Plan.

The Anchorage 2020 Comprehensive Plan identifies goals for industrial development and retention and calls for properties strategically located with rail, port, and international airport access to be preserved for industrial uses. It articulates the community desire to maintain a strong and diversified industrial economic base, enhance the overall quality and character of industrial development sites, and to find resolution to conflicts between adjacent industrial and residential land uses.

The goals indicate that residential land should not be converted to industrial uses, and that mixed light industrial/commercial developments will exhibit compatible users, create pedestrian oriented amenities, and address safety issues between customers and freight movement.

The Chugiak-Eagle River Comprehensive Plan calls for ensuring an adequate supply of land in suitable locations for commercial and industrial development that is compatible with the community needs and resources. The plan calls for industrial land in these locations to be protected against non-industrial uses. It acknowledges the need for industrial lands to have access to adequate utilities and services, access to major transportation systems, and buffering from adjoining incompatible uses, and requires industrial development take into account potential impacts on other uses with regard to access, parking, utilities, aesthetics and environmental quality.

Overall, the comprehensive plans envision a built environment that sustains long-term economic growth and viability by promoting residential, commercial and industrial development. It aims for a diverse economy, capitalizing on Anchorage's regional, state, and global position, and of Anchorage's leadership opportunity in Alaska's resource development.

Circulation

The industrial road network in Anchorage has developed in a similar fashion to many mid-century industrial centers throughout the United States. Older districts have roads that were built for lighter, shorter vehicles and less intensive uses. Newer districts developed wider roads with the ability to withstand heavier loads and appropriate turning radii. This relationship of new and old road infrastructure is evident in all of the observed Subareas. As a follow up to the Freight Mobility Study for the Anchorage Metropolitan Area published in 2001, Anchorage is undertaking incremental improvements to the Freight Distribution System.

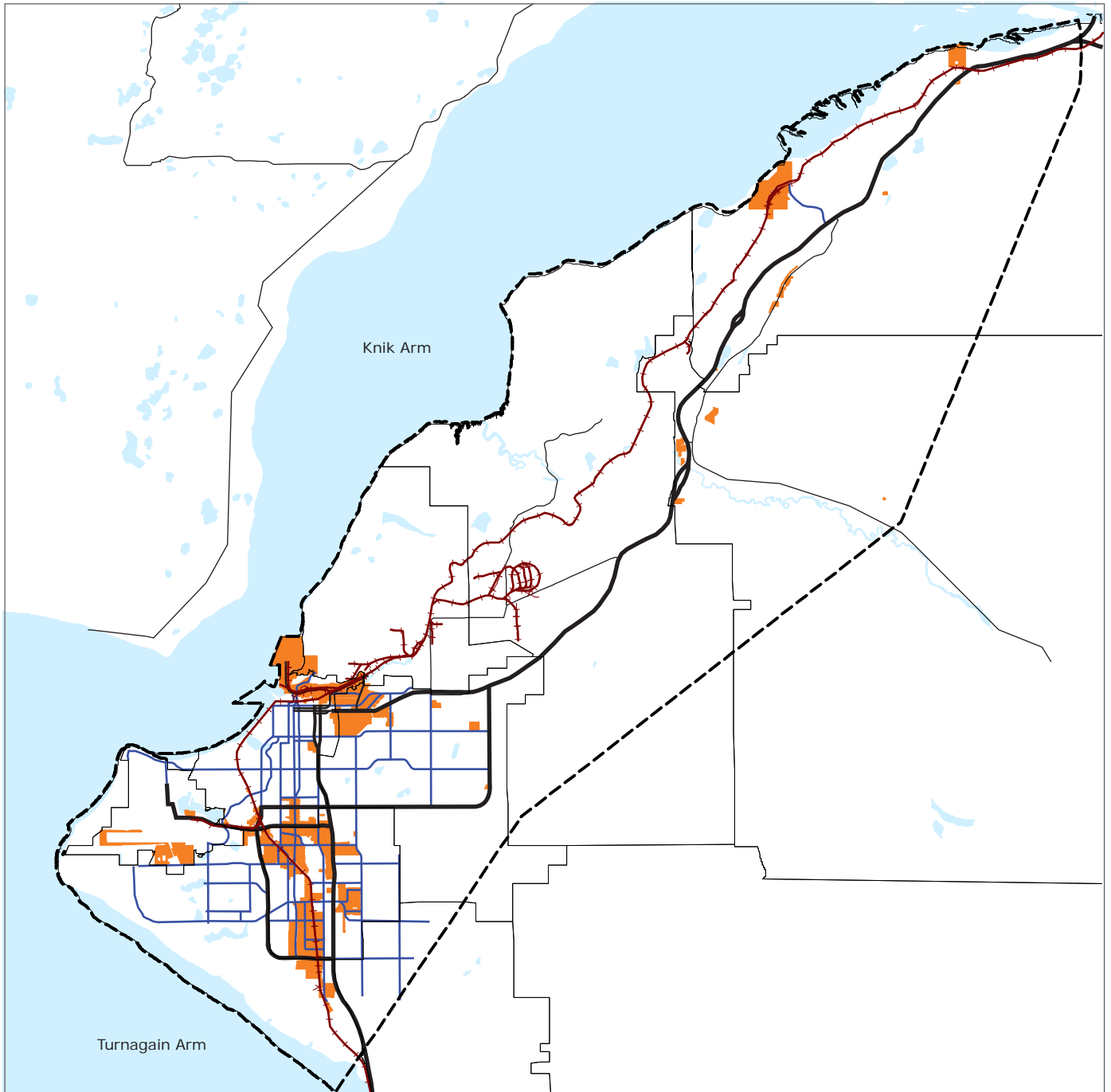
The regional circulation network in the bowl relies on two primary highway corridors, the Seward Highway, and the Old Glenn Highway. These primary double load routes serve the entire current industrial supply, including the port, the international airport, and the railroad industrial complex either directly, or through a series of industrial serving arterials. Three primary supporting double load routes, the International Airport Road connector, the Minnesota Drive/O'Malley Road loop, and the Tudor Road/Muldoon Road loop have been designated to increase the efficiency of goods movement and to minimize the conflicts of transitioning between the Seward Highway and the Old Glenn Highway in the downtown district.

Infrastructure

Infrastructure improvements in the Anchorage Bowl, based on available information, are available for industrial development both in terms of capacity and location. Areas needing infrastructure for development are typically charged for the improvements through a local improvement district. During interviews, development entities indicated reluctance on the part of some smaller landowners with low demand to enter into improvement districts and take on additional costs.

Two primary industrial development areas will need infrastructure improvements to support development. These include the large grouping of parcels at the southern end of the Central Subarea at C Street and King Street, as well as the Birchwood Airport industrial parcels in Chugiak-Eklutna. **Figure 20** below shows the circulation infrastructure system in Anchorage and the larger region.

Figure 20:
Anchorage Regional Circulation Infrastructure



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Alaska Railroad



Primary Double Load Routes



Industrial Serving Arterials



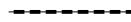
Other Regional Roads



Industrial Parcels in MOA



Project Perimeter



Industrial Typologies

In the four industrial classifications; Industrial Services/Assembly/Manufacturing, Warehouse Distribution, Miscellaneous Industrial, and Industrial Flex Space, several building construction types can be observed in Anchorage. These construction types are described below.

Warehouse/Supply

Throughout the bowl, and particularly in the Ship Creek area, there is evidence of both modern tilt-up concrete and high-bay metal building warehousing, some with dock-high loading bay. In addition, there appears to be a significant quantity of warehouse structures that are pre-1950s wood framed buildings and coated fabric industrial tents. These are typically stand alone buildings with ancillary office uses, although some also have fabrication facilities and exterior yard space.



Laydown and Storage Yard

Requiring little if any vertical improvements, laydown and storage yards throughout the bowl are characterized as both paved and unimproved yard space, typically fenced, with a variety other improvements ranging from old residential uses that have incorporated their remaining site for storage, small offices, and simple gate houses.



Storage

This typology is directed primarily at both single and multi-story self-storage buildings and yards which are classified as an industrial use, but primarily serve the commercial and residential population as personally accessed storage. The buildings are primarily metal, although some are hybrids with concrete masonry and metal. Many of these facilities also have yard space for vehicle storage.



Manufacturing and Fabrication

Although there is not an extensive supply of manufacturing and fabrication facilities in the bowl, those that do exist vary widely in size of the facility, the amount of building to yard space, and the construction type. Observations indicate that many of these facilities are in older buildings and that many have undergone incremental growth over the years as demand increased.



Mixed-Use

This typology is characterized by buildings that contain both industrial and commercial uses. This can either be retail sales out of a warehouse type configuration or in many cases, commercial offices such as engineering companies that also have equipment repair, small fabrication, or storage needs. In many observed cases, multi-tenant buildings housed both industrial and commercial tenants.



Characterization of Industrial Supply

Table 14 provides a breakdown, by Subarea, of currently undeveloped and underutilized industrial land based on GIS/CAMA data. In general, industrial land was identified as redevelopable or underutilized if (a) the parcel was industrially zoned but accommodated a very-low-density residential use, a residential use with a very-low assessed value, or a very-low FAR; or (b) the parcel is zoned commercial but has a commercial or industrial use associated with a very-low assessed value or FAR.¹⁸

As shown, the Central Subarea of the Anchorage Bowl has by far the largest share of land supply at nearly 60 percent of the Study Area. This land is roughly evenly divided between vacant and underutilized parcels. Other subareas with significant available land supply include Chugiak/Eklutna with 12.5 percent of the region's total, and the Northeast Subarea with just over 10 percent of the region's total vacant and underutilized land supply. Overall, more than 800 acres are defined as undeveloped throughout the MOA. In addition, more than 660 acres of I-1 and I-2 land have been identified as potentially underutilized and redevelopable. As identified in **Table 1**, some 370 acres of the undeveloped land have been identified to have severe or very severe soil limitations.¹⁹ Conversely, parcels identified with redevelopment potential are subject to additional development constraints including contamination, small parcel sizes, encroachment of non-industrial uses, and inadequate infrastructure.

¹⁸ Although a very general description of redevelopable and underutilized industrial is provided here, a very complex and specific methodology was used to classify these parcels. A more detailed technical description of categories of industrial land supply is found in **Appendix B**.

¹⁹ United States Department of Agriculture: "Soil Survey of Anchorage Alaska."

Table 14
Anchorage Bowl Industrial Land Assessment
Summary of Industrial Land Supply in MOA [1]

District	Currently Undeveloped		Underutilized/ Redevelopable		Total	
	Acres	% of Total	Acres	% of Total	Acres	% of Total
Anchorage Bowl						
Northwest	31.0	3.9%	36.3	5.5%	67.3	4.6%
Northeast	70.8	8.8%	76.5	11.6%	147.3	10.1%
Central	458.1	57.2%	411.8	62.2%	869.9	59.5%
Southeast	0.0	0.0%	0.0	0.0%	0.0	0.0%
Southwest	38.3	4.8%	98.2	14.8%	136.5	9.3%
Subtotal Anchorage Bowl	598.2	74.7%	622.8	94.0%	1,221.1	83.5%
Other Areas						
Chugiak/ Eklutna	153.8	19.2%	29.0	4.4%	182.8	12.5%
Eagle River	48.7	6.1%	10.6	1.6%	59.3	4.1%
Subtotal Other Areas	202.5	25.3%	39.6	6.0%	242.1	16.5%
Total	800.7	100.0%	662.4	100.0%	1,463.1	100.0%

"supply_summ"

[1] Does not include publicly-owned land.