Chapter 3. Industrial Lands in the Central Puget Sound Region

CHAPTER INTRODUCTION

This chapter presents the current conditions of industrial lands in the central Puget Sound region, including the zoning policies that govern the region's industrial lands; tabulations of land area throughout the industrial lands, including total land and land that is available to accommodate growth. An important component of the analysis of industrial land in the region is the structure of policies and regulations governing industrial-zoned land. This chapter identifies specific policies and elements of land use regulatory regimes across cities that affect the supply of industrial land at an empirical level, and identifies some innovative and effective local approaches. It compares zoning across designated MICs as well as individual jurisdictions.

The second section of this chapter quantifies the amount of land in industrial areas, including areas with potential infill and redevelopment opportunities. A third section provides contextual considerations of regionwide industrial supply, including infrastructure access, climate change considerations, brownfields, and environmental justice. The section that follows provides detailed profiles of the use and character of each industrial subarea in the region.

INDUSTRIAL ZONING ACROSS THE REGION

Cities across the central Puget Sound region use comprehensive plan policies and development regulations to manage their supplies of industrial land. To avoid the appearance that all industrial land designations are roughly equivalent, this section categorizes lands upon which significant industrial development is present and/or permitted to occur as one of the following two:

1. **Core industrial.** This segment includes zoning designations on lands dominated by traditional industrial land uses. These zoning designations include lands on which traditional industrial land uses are permitted to occur.
2. **Industrial-commercial.** This segment includes zoning designations on lands with a significant component of both industrial and commercial uses. These zoning designations include lands on which industrial and commercial uses are permitted to occur.

Designated Manufacturing/Industrial Centers

Since 2003, MICs have been recognized at the regional level and are a key component of the regional growth strategy (see **Exhibit 3.1**). These regional centers are intended to be locations of more intensive industrial activity that are typically characterized by large contiguous parcels served by the region's major transportation infrastructure, including roads, rail, and port facilities. VISION 2040 discourages non-supportive land uses in regional MICs, such as retail, non-related offices, or housing, in order to preserve the basic sector industries located in these centers.

Regional MICs, together with designated regional growth centers, represent a small share of the region's land, but contain a significant share of the region's employment and, in growth centers, the region's population and housing. VISION 2040's regional growth strategy expects regional centers to accommodate a significant share of the region's growth.

Centers are recognized at the regional level through a set of designation procedures. The purpose of the procedures is to:

a. Document that the proposed center has the desire, capacity, and development potential to play a regional role in attracting and accommodating a significant share of the jurisdiction's employment growth.

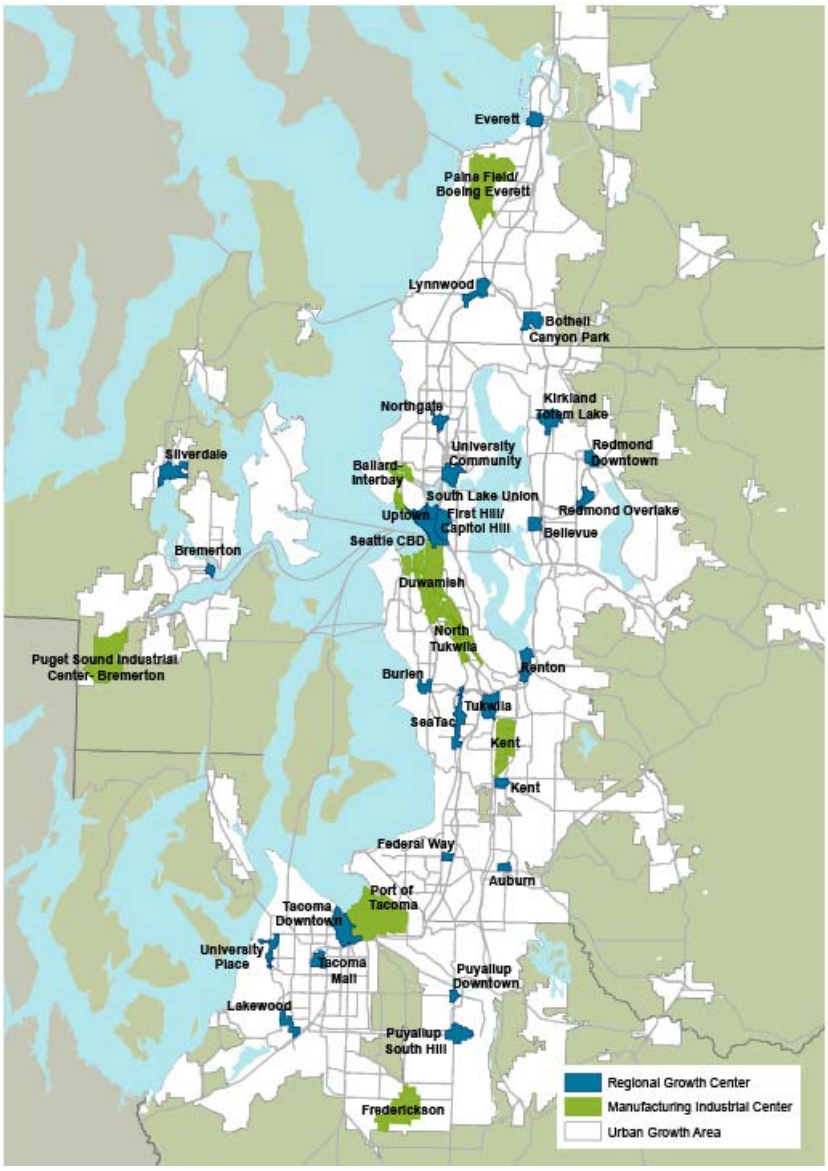
b. Limit the number and geographic distribution of regional MICs. The region needs to maintain a reasonable number and distribution in order for MICs to:

> i. Serve as an organizing framework for the Freight and Goods component of the region's Metropolitan Transportation System.
>
> ii. Serve as the primary concentrations of industrial- and manufacturing-related jobs that are important to the region.
>
> iii. Have the potential to generate sufficient market demand to make centers successful.

c. Provide regional consistency regarding the type, location, distribution, and development potential of new manufacturing industrial centers.

d. Ensure that regional MICs meet the goals and expectations established in VISION 2040.

Exhibit 3.1. Regional Growth Centers and Manufacturing/Industrial Centers, Central Puget Sound Region, 2014



Source: PSRC, 2014.

Regional Manufacturing/Industrial Centers

There are currently eight regional MICs. Regional MICs represent only 0.6% of the regional land area (about 24,000 gross acres) but contain about 9.3% of total employment (150,000 employees). The eight regional MICs include the following:

- Ballard-Interbay (Seattle)
- Duwamish (Seattle)
- Frederickson (Unincorporated Pierce County)
- Kent (Kent)
- North Tukwila (Tukwila)
- Paine Field/Boeing Everett (Everett, Unincorporated Snohomish County)
- Port of Tacoma (Tacoma)
- PSIC-Bremerton (formerly South Kitsap Industrial Area)

Countywide Manufacturing/Industrial Centers

In addition to regional centers, VISION 2040 supports development in smaller-scale centers in all municipalities (see **Exhibit 3.2**). Centers are recognized first in comprehensive plans and then in countywide planning policies. When countywide centers meet minimum thresholds and have done significant planning, including a market study, they may submit for designation at the regional level.

Currently, three centers have been designated at the countywide level; these include the following:

- South Tacoma Valley (Tacoma)
- Sumner-Pacific (Sumner and Pacific)
- Arlington-Marysville (Arlington and Marysville)

Exhibit 3.2. Summary of Industrial Employment and Manufacturing/Industrial Centers in the Central Puget Sound Region, 2013

Land Type	Industrial Jobs on Industrial Zoned Land	
	Total # of Jobs	% of Total Jobs
Regional MICs	122,200	40.1 %
Countywide MICs	15,300	5.0%
Remainder within Subareas	151,700	49.7%
Dispersed	15,800	5.2%

Manufacturing/Industrial Centers Zoning

- **The Ballard-Interbay MIC** (BINMIC) is located in the northwest part of the city of Seattle. It is among the smallest MICs in size, with a gross acreage of 971 acres. It encompasses a working waterfront focused on commercial fishing, boat building and repair, as well as wharfs, railyards, warehouses and general industrial facilities. A total of seven zoning designations regulate land within the MIC. These include four zoning designations within the core industrial category and three within the industrial-commercial category. Buffer zones are used along the edges of the MIC where industrial-zoned land is adjacent to retail and residential uses.

- **The Duwamish MIC** is located in the southern part of the city of Seattle. It is among the largest MICs in size, with a gross acreage of 5,062 acres. The Duwamish MIC is the Port of Seattle's primary marine shipping area and working waterfront, with deep water berths, wharfs, piers, shipyards, dry docks, container cranes, on-dock rail, container yards, cargo distribution and warehousing, oil and petroleum storage facilities and major railroad yards. At the southern end it includes a large part of King County International Airport/Boeing Field. The MIC also contains a number of heavy industries such as Nucor Steel and three concrete plants. With a total of nine zoning designations, the Duwamish has the finest-grained zoning among MICs. These include four designations in the core industrial category and five in the industrial-commercial category. Buffer zones are used along the edges of the MIC around residential areas such as Georgetown.

- **The Frederickson MIC** is located within urban unincorporated Pierce County, southeast of Tacoma. It has a gross acreage of 2,837 acres. The Boeing Company operates on land here. Since it was designated in anticipation of development, this MIC includes a significant amount of vacant land. A total of three zoning designations regulate land within the MIC. These include one zoning designation in the core industrial category and two in the industrial-commercial category.

- **The Kent MIC** is located in the Kent Valley north of downtown Kent. The MIC comprises the eastern half of a larger industrial area called the Kent North Valley Industrial Area. The Kent MIC is a smaller regional MIC with a gross acreage of 1,685 acres. The two zoning designations that regulate land within the MIC are in the core industrial category.

- **The North Tukwila MIC** extends from Seattle's southern city limit to South 126th Street. It is among the smaller MICs in size, with a gross acreage of 961 acres. A portion of King County International Airport/Boeing Field is located within the MIC, at the north end. The two zoning designations that regulate land within the MIC are in the core industrial category.

- **The Paine Field/Boeing Everett MIC** is located in the City of Everett and unincorporated Snohomish County. It is among the larger MICs in size, with a gross acreage of 4,241 acres. The MIC is home to Boeing's aeronautical facilities and activity in the MIC is dominated by aviation; aircraft production, maintenance, testing, flight training, business and corporate aviation, and military aviation activities. A total of five zoning designations regulate land within the MIC. All five of these designations are in the core industrial category.

- **The Port of Tacoma MIC** is located in the City of Tacoma, along the waterfront and on lands adjoining the waterways on Tacoma's Commencement Bay. It is among the larger MICs in size, with a gross acreage of 5,160 acres. It is dominated by port and marine terminals, marine cargo, on-dock intermodal rail yards, container terminals, roll-on/roll-off facilities, non-containerized cargo facilities (moving grain, fruit, alumina, and wood chips), automobile import facilities, shipyards, boat building and drydocks. A total of six zoning designations regulate land within the MIC. All six of these designations are included in the core industrial category.

- **The Puget Sound Industrial Center-Bremerton MIC** is located in Southwest Bremerton. It is among the larger MICs in size, with a gross acreage of 3,565 acres. Since it was designated in anticipation of development, this MIC includes a significant amount of vacant parcels. The three zoning designations that regulate land within the MIC are in the core industrial category.

The region's eight MICs include 37 zoning designations. Of these, 28 zoning designations regulate lands dominated by traditional industrial land uses and are categorized as core industrial. Nine designations regulate lands with a significant component of both industrial and commercial uses and are categorized as industrial-commercial. Aviation specific zoning designations are present in four of the eight MICs.

Exhibit 3.3. lists the zoning designations across the MICs and categorizes them as core industrial or industrial-commercial.

Exhibit 3.4. lists the zoning designations across the MICs, categorizes them as core industrial or industrial-commercial and lists their estimated existing employment and acreage.

Exhibit 3.3. Zoning by Manufacturing/Industrial Center in the Central Puget Sound Region, 2013

MIC	CORE INDUSTRIAL	INDUSTRIAL-COMMERCIAL
Ballard-Interbay	1. Industrial General 1 (IG1 U/45) 2. Industrial General 1 (IG1 U/65) 3. Industrial General 2 (IG2 U/65) 4. Industrial General 2 (IG2 U/45)	1. Industrial Commercial (IC-65) 2. Industrial Commercial (IC-45) 3. Industrial Buffer (U/45)
Duwamish	1. Industrial General 1(IG1 U/85) 2. Industrial General 1 (IG1 U/65) 3. Industrial General 2 (IG2 U/85) 4. Industrial General 2 (IG2 U/65)	1. Industrial Buffer (IB U/45) 2. Industrial Buffer (IB U/85) 3. Industrial Buffer (IB U/65) 4. Industrial Commercial (IC 85-160) 5. Industrial Commercial (IC-65)
Frederickson	1. Pierce County Employment Center (EC)	1. Pierce County Employment Services (ES) 2. Pierce County Community Employment (CE)
Kent MIC	1. General Industrial (M3) 2. Limited Industrial (M2)	
North Tukwila	1. Manufacturing Industrial Center/ Heavy Industrial (MIC/H) 2. Manufacturing Industrial Center/Light Industrial (MIC/L)	
Paine Field / Boeing Everett	1. Heavy Commercial Light Industrial (C-2) 2. Office and Industrial Park (M-1) 3. Heavy Manufacturing (M-2) 4. Light Industrial (LI) 5. Business Park (M-M)	
Port of Tacoma	1.Industrial, Light Industrial (M1) 2. Heavy Industrial (M2) 3. Port Maritime and Industrial (PMI) 4. Shoreline 8 (S8) 5. Shoreline 9 (S9) 6. Shoreline 10 (S10)	
PSIC- Bremerton	1. General Industrial (GI) 2. Port Industrial Mix (PIM) 3. Aviation Business (AB)	

Exhibit 3.4. Zoning, Total Employment and Acreage by MIC in the Central Puget Sound Region, 2013

MIC	CORE INDUSTRIAL	INDUSTRIAL COMMERCIAL	TOTAL EMPLOYMENT	ACREAGE
Ballard-Interbay	1. Industrial General 1 (IG1 U/45) 2. Industrial General 1 (IG1 U/65) 3. Industrial General 2 (IG2 U/65) 4. Industrial General 2 (IG2 U/45)	1. Industrial Commercial (IC-65) 2. Industrial Commercial (IC-45) 3. Industrial Buffer (U/45)	14,237	971 Ballard-Interbay
Duwamish	1. Industrial General 1(IG1 U/85) 2. Industrial General 1 (IG1 U/65) 3. Industrial General 2 (IG2 U/85) 4. Industrial General 2 (IG2 U/65)	1. Industrial Buffer (IB U/45) 2. Industrial Buffer (IB U/85) 3. Industrial Buffer (IB U/65) 4. Industrial Commercial (IC 85-160) 5. Industrial Commercial (IC-65)	58,771	5062 Duwamish
Frederickson	1. Pierce County Employment Center (EC)	1. Pierce County Employment Services (ES) 2. Pierce County Community Employment (CE)	3,330	2837 Frederickson
Kent MIC	1. General Industrial (M3) 2. Limited Industrial (M2)		15,046	1970 Kent
North Tukwila	1. Manufacturing Industrial Center/ Heavy Industrial (MIC/H) 2. Manufacturing Industrial Center/Light Industrial (MIC/L)		13,499	961 North Tukwila
Paine Field / Boeing Everett	1. Heavy Commercial Light Industrial (C-2) 2. Office and Industrial Park (M-1) 3. Heavy Manufacturing (M-2) 4. Light Industrial (LI)		42,413	4241 Paine Field/Boeing Everett
Port of Tacoma	1.Industrial, Light Industrial (M1) 2. Heavy Industrial (M2) 3. Port Maritime and Industrial (PMI) 4. Shoreline 8 (S8) 5. Shoreline 9 (S9)		9,250	5160 Port of Tacoma
Puget Sound Industrial Center-Bremerton	1. General Industrial (GI) 2. Port Industrial Mix (PIM) 3. Aviation Business(AB)		876	3565 Puget Sound Industrial Center-Bremerton

Local Zoning for Industrial Lands[1]

Exhibit 3.5. shows the various zoning designations across jurisdictions in the region with lands upon which significant industrial development is present and/or permitted to occur. In addition to core industrial and industrial-commercial segments of gross supply, two other segments of industrial lands are included in this table – aviation operations areas and military industrial – but are not separately identified. Jurisdictions with aviation zoning designations are Arlington, Auburn, Bremerton, Darrington, Everett, Monroe, Mukilteo, Pierce County, Renton, SeaTac, Seattle, Snohomish County, Snohomish, and Tukwila. Those with military zoning designations are Bremerton, DuPont, Everett, Kitsap County, Lakewood, and Pierce County. The following were noted based on a comparison of zoning across the region:

- 65 out of 82 jurisdictions in the region contain lands upon which significant industrial development is present and/or permitted to occur.
- 15 cities use the Business Park zoning designation.
- 3 cities use specific Tech Park zoning designations.
- 8 jurisdictions have Heavy Industry designations.
- 21 jurisdictions allow for only light industrial uses.

Exhibit 3.5. Existing Zoning Across Jurisdictions

	Jurisdiction	Core Industrial	Industrial-Commercial
1	**Algona**	Light Industrial (LI)	
2	**Arlington**	General Industrial (GI), Light Industrial (LI), Aviation Flightline (AF)	Business Park (BP)
3	**Auburn**	Heavy Industrial (M2), Light Industrial (M1), Airport Landing Field (LF), Environmental Park (EP)	Heavy Commercial (C3)
4	**Bainbridge**	Water Dependent Industrial (WD-1), Light Manufacturing	
5	**Bellevue**	Light Industrial (LI)	
6	**Black Diamond**	Light Industrial (Bus Pk/Light Ind), Industrial (IND)	
7	**Bothell**	Light Industrial (LI)	Office Professional (OP), Community Business (CB), Light Industrial (LI), Motor Vehicle Sales Overlay (MVSO)
8	**Bonney Lake**		Eastown

	Jurisdiction	Core Industrial	Industrial-Commercial
9	**Bremerton**	General Industrial (GI), Industrial Park (IP), Marine Industrial (MI), Industrial (I), Naval Shipyard, Port Industrial Mix (PIM), Aviation Business (AB), Mixed Employment (ME)	Freeway Corridor (FC)
10	**Buckley**	Industrial (IND)	
11	**Burien**	Industrial (I), Airport Industrial-2 (AI-2)	Airport Industrial-1 (AI-1)
12	**Carnation**	Light Industrial/Manufacturing (LI/M), Service Commercial (SC)	
13	**Covington**	Industrial (I)	General Commercial (GC)
14	**Darrington**	Light Industrial (LI)	
15	**Des Moines**		Business Park (B-P)
16	**DuPont**	Industrial (IND), Manufacturing Research (MRP), Business TechPark (BTP)	
17	**Duvall**	Light Industrial (LI)	
18	**Edgewood**	Industrial (I)	Business Park (BP)
19	**Everett**	Heavy Manufacturing (M-2), Marine Services (M-S), Office and Industrial Park (M-1), Evergreen Way (E-1), Business Park (M-M), Waterfront Commercial (W-C)	Heavy Commercial Light Industrial (C-2), Heavy Commercial Light Industrial ES (C-2ES)
20	**Fife**	Community Commercial, Industrial, Regional Commercial	Business Park
21	**Federal Way**	Commercial Enterprise (CE)	Corporate Park (CP-1), Office Park (OP-1)
22	**Gig Harbor**	Employment District (ED)	Planned Community Development Business Park District (PCD-BP), General Business (B-2), Public Institutional (PI), Residential and Business District (RB-2)
23	**Granite Falls**	Industrial (I), Light Industrial (LI), Industrial Retail (IR)	
24	**Index**	Light Industrial -Railroad	

	Jurisdiction	Core Industrial	Industrial-Commercial
25	**Issaquah**	Intensive Commercial (IC), Mineral Resources (M)	
26	**Kenmore**	Regional Business (RB)	
27	**Kent**	Industrial Park (M1), General Industrial (M3) , Limited Industrial (M2), Industrial Agricultural (MA), Industrial Park/commercial (M1-C)	Industrial Park/commercial (M1-C), Commercial Manufacturing-1(CM-1), Commercial Manufacturing (CM-2)
28	**King County**	Industrial (I)	
29	**Kirkland**	Light Industrial Technology (LIT), Planned Area (PLA 6G (2)), Totem Lake -10 A (TL 10A), Totem Lake -10 C (TL 10C), Totem Lake -10E (TL 10E), Totem Lake -9A (TL 9A), Totem Lake -7 (TL 7), Totem Lake -10B(TL 10B), Totem Lake -10D (TL 10D), Totem Lake (TL 10E), Totem Lake (TL 6A)	
30	**Kitsap County**	Industrial (IND), Light Industrial (LI), Rural Industrial (RI), Business Center (BC), Twelve Trees Employment Center (TTEC), Military (MIL), Park (P), Rural Commercial (RCO), Rural Employment Center (REC)	
31	**Lake Stevens**	General Industrial (GI), Light Industrial (LI), Public/ Semi-Public (P/SP), General Industrial w/Development Agreement (GIDA)	
32	**Lakewood**	Industrial Two (I2), Industrial One (I1), Industrial Business Park (IBP)	Air Corridor 1 (AC1), Clear Zone (CZ)
33	**Lynnwood**	Light Industrial (LI), Public (P1), Planned Unit Development (PUD)	Business/Technical Park (BTP), Light Industrial (LI)
34	**Maple Valley**	Business Park (BP), Service Commercial (SC), Community Business (CB), Central Commerce (CC), Planned Unit Development (PUD)	
35	**Marysville**	General Industrial (GI), Light Industrial (LI)	
36	**Mill Creek**		Business Park (BP)
37	**Milton**	Light Manufacturing (M-1)	

	Jurisdiction	Core Industrial	Industrial-Commercial
38	**Mountlake Terrace**		Light Industrial/ Office Park (LI/OP)
39	**Monroe**	Light Industrial (LI), General Industrial (GI), Limited Open Space-Airport (LOSA)	
40	**Mukilteo**	Industrial Park (IP), Light Industrial (LI), Heavy Industrial (HI), Planned Industrial (PI), Business Park (BP)	
41	**North Bend**	Employment Park-1 (EP-1)	Employment Park (EP-2)
42	**Orting**	Public Facilities	
43	**Pacific**	COM, IND	COM
44	**Pierce County**	Pierce County Employment Center (EC), Pierce County Rural Industrial Center (RIC), Pierce County Urban Military Lands (UML)	Pierce County Community Employment (CE), Pierce County Employment Services (ES), Pierce County Research Office (RO), Pierce County Employment Based Planned Communities (EBPC)
45	**Port Orchard**	Employment-Industrial/Office (EO)	
46	**Poulsbo**	Light Industrial (LI)	Business Park (BP), Office Commercial Industrial (OCI)
47	**Puyallup**	Limited Manufacturing (ML), Public Facilities (PF)	Business Park (MP)
48	**Redmond**	Industry (I), Manufacturing Park (MP), Business Park (BP), Gateway Design District (GDD1)	Overlake Business & Advanced Technology (OBAT), Business Park (BP)
49	**Renton**	Industrial Medium (IM), Industrial Light (IL), Industrial Heavy (IH)	
50	**Roy**	Light Industrial (LI)	
51	**SeaTac**	Industrial (I), Aviation Operations (AVO), Business Park (BP)	Aviation Business (ABC)

	Jurisdiction	Core Industrial	Industrial-Commercial
52	**Seattle**	Industrial General 2 (IG2 U/65), Industrial General 1 (IG1 U/45), Industrial General 1 (IG1 U/65), Industrial General 2 (IG2 U/85), Industrial General 2 (IG2 U/45), Industrial General 1 (IG1 U/85)	Industrial Commercial (IC-45), Industrial Commercial (IC-65), Industrial Commercial (IC-85), Industrial Buffer (IB U/85), Industrial Buffer (IB U/45), Industrial Buffer (IB U/65)
53	**Skykomish**	Industrial	
54	**Snohomish County**	Industrial Park, Rural Industrial, Heavy Industrial, Freeway Service, General Commercial, Native American Land, Planned Industrial Park, Rural Industrial	Light Industrial
55	**Snohomish**	Industrial (IND), Airport Industry (AIN)	Business Park (BP)
56	**Snoqualmie**	Utility Park (UP), Planned Com/Industrial (PCI)	Mixed Use (MU)
57	**South Prairie**	Industrial (IND)	
58	**Stanwood**	General Industrial (GI), Light Industrial (LI), General Commercial (GC)	
59	**Steilacoom**	Industrial (I)	
60	**Sultan**	Economic Development (ED), Public and Institutional (P/I)	
61	**Sumner**	Light Industrial, Heavy Industrial	Interchange Commercial
62	**Tacoma**	Light Industrial (M1), Shoreline (S9), Heavy Industrial (M2), Port Maritime and Industrial (PMI), Shoreline (S10), Shoreline (S7), Planned Business Development (PDB)	Warehouse Residential (WR), Commercial Industrial Mixed-Use (CIX)
63	**Tukwila**	Heavy Industrial (HI), Manufacturing Industrial Center/ Heavy Industrial (MIC/H), Light Industrial (LI), Manufacturing Industrial Center/Light Industrial (MIC/L), Tukwila Valley South (TVS)	Commercial/Light Industrial (CLI)

	Jurisdiction	Core Industrial	Industrial-Commercial
64	**University Place**		Light Industrial - Business Park (IB)
65	**Woodinville**	Industrial (I)	General Business (GB)

THE SUPPLY OF INDUSTRIAL LAND

Summary

For the purposes of this report, and to be consistent with PSRC's 1998 Industrial Land Supply and Demand report, industrial land supply is characterized as either "gross supply" or "net supply." Gross industrial land supply refers to all industrial land, including active sites, vacant land, and physically redevelopable land. Net industrial land supply refers to a subset of the gross supply that may be available for growth, including vacant land, and physically redevelopable land.

The gross industrial land supply in the central Puget Sound region totaled 71,983 acres as of 2013. The net industrial land supply in the central Puget Sound region totaled 28,615 acres as of 2013. Since the 1998 report, gross industrial land supply has undergone erosion in some areas, with modest growth in others.

Methodology

Defining Industrial Lands

The core findings of this report depend on how to define what makes land industrial for inclusion in this analysis. This seemingly simple concept is a complex task given the array of mixed-use zones among the many jurisdictions (82 cities and towns, plus military and tribal lands, and four counties) and their diverse systems of zoning and land use designation.

Complicating issues include lands designated as "Business Park" or "Employment Center." Land designated for "Public Facilities" in comprehensive plans includes schools and parks, but also utilities and communication facilities. Modern hybrid and mixed-use zones and overlays allow for a blend of commercial, industrial and office uses, to further complicate this important starting point.

This study defines industrial lands as those lands upon which significant industrial development is present and/or permitted to occur, according to the steps presented in the following sections:

STEP 1 – ZONING AND FUTURE LAND USE DESIGNATION
The first step in attaining a selection of the region's industrial land base is to intersect lands designated for future industrial use in area comprehensive plans with lands currently zoned for industrial use in city and county zoning codes. Comprehensive plan designations represent community consensus and adopted policy around the future use of land within jurisdictional boundaries. The Growth Management Act requires that zoning be consistent with comprehensive plan designations.

STEP 2 – RESEARCH AND REFINEMENT
In cases where the industrial land designation was unclear, research ascertained current land use and development by review of assessors' parcel data, satellite imagery, web-based mapping applications, and Internet searches, and consultation with jurisdictions' planning staff.

STEP 3 – SEGMENTATION OF GROSS LAND SUPPLY
Step 2 resulted in a refined selection of gross industrial land supply (occupied and vacant lands). Variation exists among jurisdictions with regard to the intended use of industrial lands, and not all industrial lands are available for private development in the same way. Obvious examples include military reservations and airports.

The study therefore segments the region's industrial lands into the following four categories:

1. **Core industrial.** Lands dominated by traditional industrial land uses.
2. **Industrial-commercial.** Lands with a significant component of both industrial and commercial uses. Examples of this type are found in Lynnwood/Mountlake Terrace, Woodinville, Everett, and Bremerton.
3. **Military industrial.** Includes industrial zones at Naval Stations Bremerton and Everett, the Naval Undersea Warfare Engineering Station adjacent to Keyport in Kitsap County, Joint Base Lewis-McChord and several others in the region.
4. **Aviation operations areas.** Land devoted to aviation operation areas (runways, taxi areas and ramps), which are unlikely to be vacated.

Special Cases

In addition, the following categories of lands in the region required special consideration.

TRIBAL LANDS
There are 10 federally recognized tribes (Tulalip, Sauk-Suiattle, Snoqualmie, Muckleshoot, Puyallup, Suquamish, Jamestown S'Klallam, Port Gamble S'Klallam, Stillaguamish, and Nisqually) present in the region, each of which manage their land in tribal areas or reservations. Of these, industrial areas are found in the following areas:

- **Tulalip Industrial Park** was identified as a major concentration in the 1998 study; as of yet, however, nothing has been developed to the west of the casino on I-5. The tribe's 2009 Comprehensive Plan Update showed a total of 641 acres designated for industrial land use. This is a significant reduction from the area designated in 1994 and considered as supply in the 1998 study.
- The **Puyallup Reservation is** located in the Tacoma tide-flats.
- **Port Madison Suquamish Indian Reservation** includes a small number of parcels designated "Rural Industrial" by Kitsap County.

NATURAL RESOURCE LANDS

Natural resource lands, especially mineral lands, encompass quarries and related resource processing. One example of such a designation is found on a gravel quarry just west of Silverdale in Kitsap County. This Mineral Resource designation is also surrounded by an Urban Industrial designation. Natural resource lands themselves are not generally included for the purposes of industrial land supply analysis, except where they are known to be transitioning to industrial use.

LIMITED AREAS OF MORE INTENSE RURAL DEVELOPMENT (LAMIRDS)

The Kitsap LAMIRDs (Type III) are small in area, but LAMIRDs containing industrial uses will be included as gross industrial land supply for the purposes of this study. The four Type III Kitsap County LAMIRDs included are: Striebel's Corner at SR 104 and Border Way; SR 3 and Pioneer Way NW; SR 307 and Gunderson Road; and Solid Waste Site Road. In addition, the Pierce County LAMIRD at McMillan Industrial Park is included.

It should also be noted that, while none currently exist in the region, the Washington State Legislature has provided guidelines for Major Industrial Developments located outside the urban growth boundary[2]:

"A county required or choosing to plan under RCW 36.70A.040 may establish, in consultation with cities consistent with provisions of RCW 36.70A.210, a process for reviewing and approving proposals to authorize siting of specific major industrial developments outside urban growth areas (Washington State Legislature 1995). Major industrial development means a master planned location for a specific manufacturing, industrial, or commercial business that: (a) requires a parcel of land so large that no suitable parcels are available within an urban growth area; or (b) is a natural resource-based industry requiring a location near agricultural land, forest land, or mineral resource land upon which it is dependent. The major industrial development shall not be for the purpose of retail commercial development or multiple tenant office parks. Several criteria must be met for a major industrial development to be approved outside an urban growth area. There are no Major Industrial Developments in the region's rural areas."

PLANNED DEVELOPMENTS

The 1998 study considered a sizeable portion of a 4,200-acre Pierce County development project formerly known as Cascadia (now known as Tehaleh) a part of the net land supply per the original master plan. Since that time, a new developer has purchased the site and recently resumed construction of new homes in the northeast quadrant of the site (Phase 1). The portion of this development that remains designated for industrial employment uses is included in the current gross and net supply analyses.

King County's Redmond Ridge Urban Planned Development also contains a limited number of industrial parcels. Specifically, industrial development at Alder Crest and 231st Way is included.

Pierce County's Sunrise Planned Development is not included, and the Gig Harbor North Business Park, included in the 1998 study as industrial land supply, is not included in the current study due to its mixed-commercial nature.

Geography of Analysis

This study analyzes industrial lands and economic impacts at the regional level, and sub-regionally. Industrial "concentrations" as defined by the 1998 study ("concentration(s) of contiguous industrial land – developed or undeveloped – at least 25 acres in size") are too numerous to allow for individual analysis or comparison. Concentrations are aggregated into larger units of analysis, termed subareas, for purposes of this study (**Exhibit 3.6**). This subarea reporting geography will allow for individual profiling at a sub-regional level (see individual **Subarea Profiles**).

The region's industrial-zoned lands fit into 13 geographic concentrations or subareas (**Exhibit 3.6**). An additional category, "dispersed," includes industrial lands scattered across the region.

Net Industrial Land Supply Approach

The 1998 report defined gross (designated) industrial land supply as lands designated in comprehensive plans for future industrial land use. Net land supply was defined as a subset comprised of vacant and underutilized land that deducts acreage for future rights-of-way and critical areas. Net supply was intended to reflect lands available for growth in the region's industrial sector. This study extends the concepts of gross (designated) and net industrial land supply to enable comparison of supply findings.

The methodology used to calculate net supply in this study is similar to both King County's and Pierce County's methods for calculating buildable lands. This report differs primarily in using improvement value per land square foot to determine barriers to redevelopment. King County utilizes the ratio of improvement value to land value, and Pierce County uses a current versus future employment ratio. The following steps were used to identify net industrial land supply.

STEP 1 - INITIAL EXCLUSIONS
Parcels were excluded that are not available or appropriate for future industrial development. These include non-industrial lands (all parcels lying outside of areas identified as gross industrial land supply, existing rights-of-way, parks, protected open space, and protected resource lands (including Conservation Futures dedications, wetlands, floodways, etc.), certain public facilities (including airports).

STEP 2 - IDENTIFY VACANT LAND

Vacant lands are defined as parcels with no or very little improvement values or building square feet (land with $.001 improvement value per square foot) as recorded by county assessors. The resulting vacant parcels are considered *Tier A* of the region's net supply.

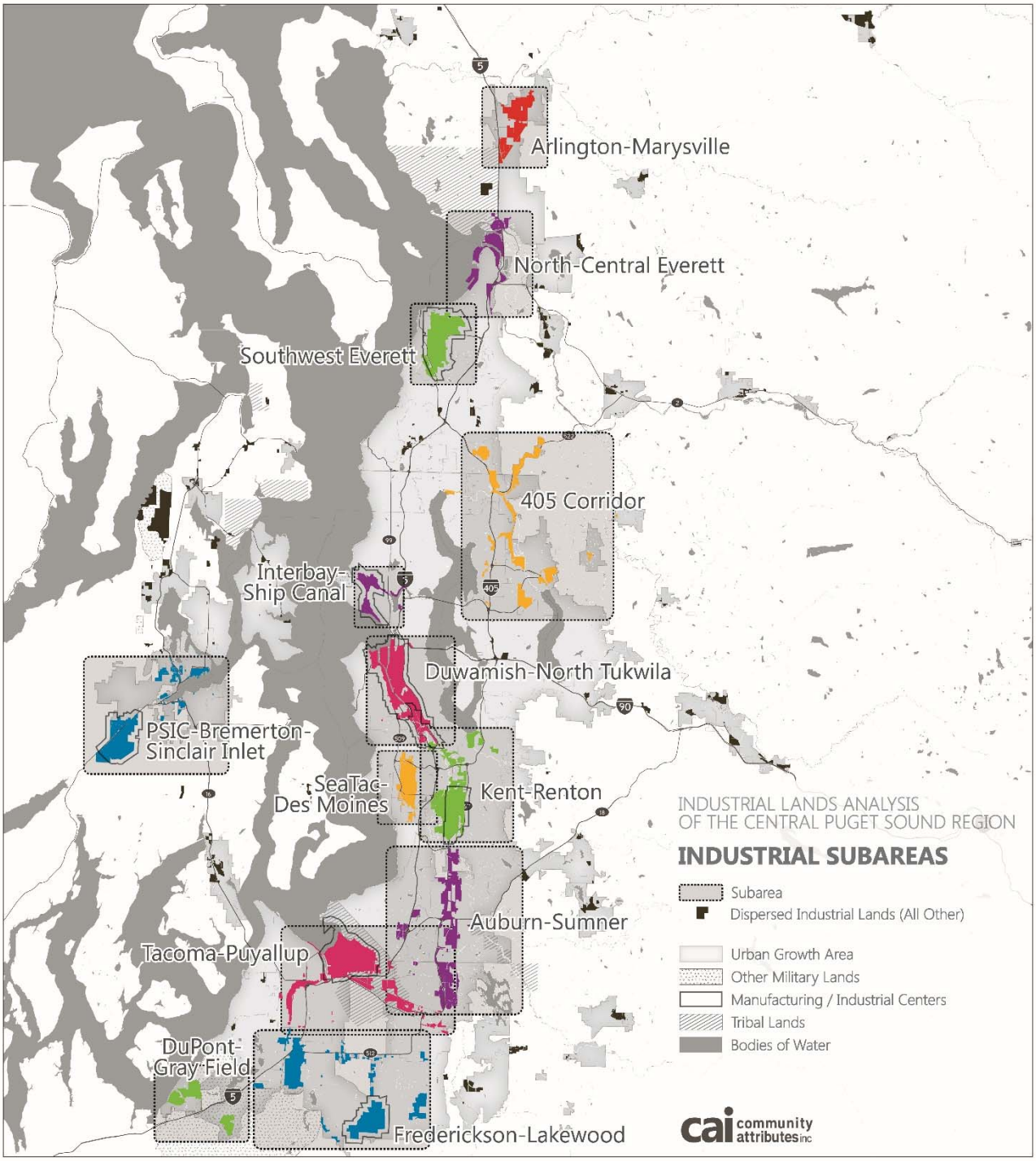
STEP 3 - IDENTIFY POTENTIALLY PHYSICALLY REDEVELOPABLE LAND

Potentially physically redevelopable lands are defined as parcels with limited improvements as a calculation of improvement value per land square foot. Tier B net supply includes parcels with minor improvements (land with $.001 to $2.50 improvement value per square foot of land). Tier C net supply includes parcels that are partially developed (land with $2.50 to $5.00 improvement value per square foot of land).

STEP 4 - CALCULATE FUTURE DEDUCTIONS

This analysis also made subtotal deductions from available supply for future street rights-of-way and future public uses (2% in urban areas, 5% for suburban areas). In addition, a 10% market factor deduction accounts for a portion of net supply that may never be redeveloped by the private market due to factors such as isolated and oddly shaped parcels, very small parcel size, obvious limits due to ownership, and other real estate market dynamics. The 10% market factor matches market factors used in King and Pierce counties' buildable land analyses.

Exhibit 3.6. Industrial Subareas for Analysis, 2013



Regionwide Profile of Central Puget Sound Industrial Land Supply

Gross Supply

The gross industrial land supply (active plus vacant and physically redevelopable) in the central Puget Sound region totals 71,983 acres as of 2013 (see **Exhibit 3.7**). The gross supply consists of four segments: core industrial lands comprise 72%, or 51,595 acres of the total; industrial-commercial land supply is 12%, totaling 8,403 acres; military industrial lands represent 9% of the region's supply at 6,746 acres; and, aviation operations areas total 7%, or 5,238 acres of supply.

King County contains the greatest proportion of the region's gross industrial land supply with 35%, followed by Pierce and Snohomish with 29% and 22%, respectively. Kitsap County contains 14% of the region's gross supply.

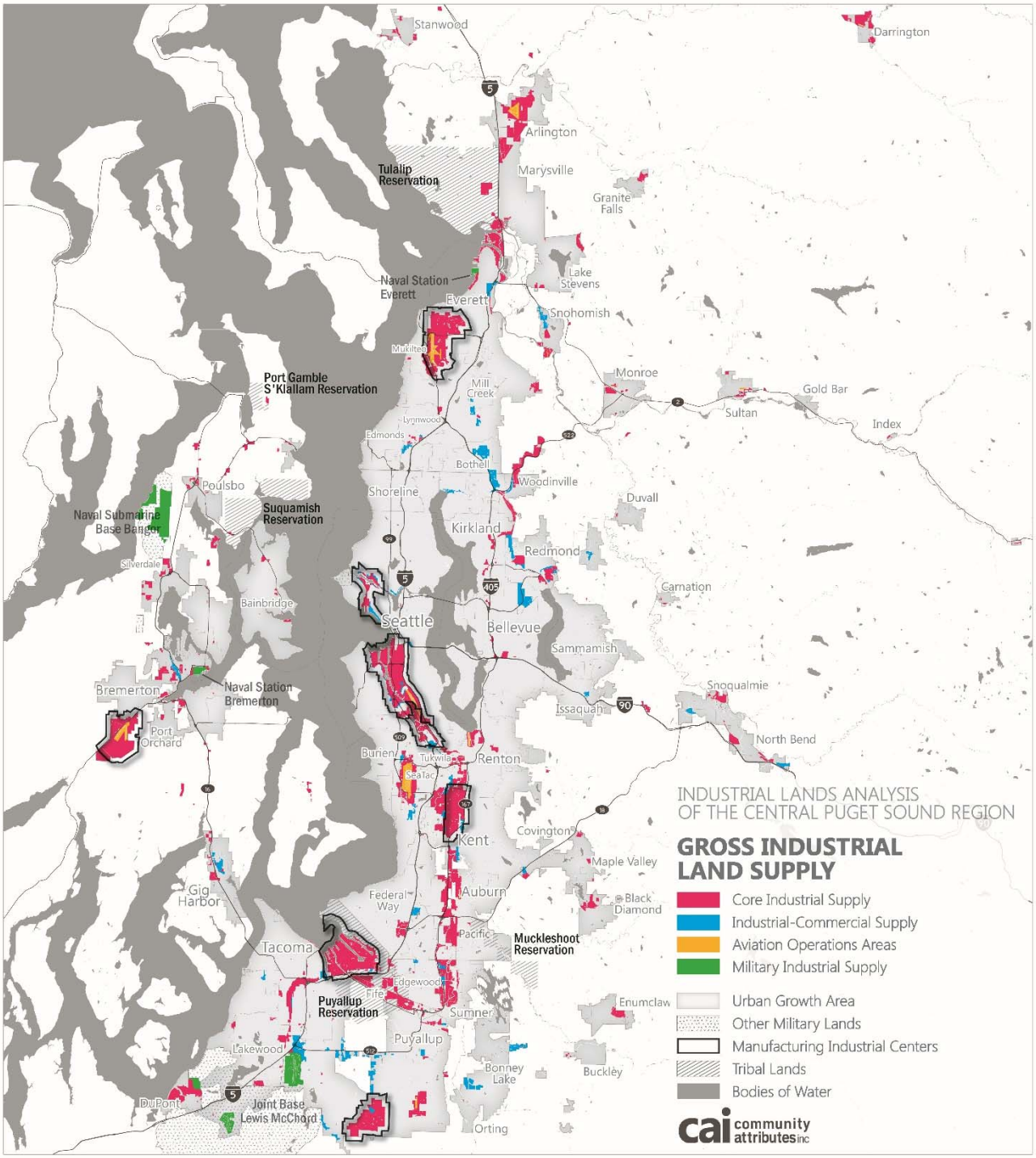
Change in Gross Supply 1998-2013

Since the 1998 report, gross industrial land supply has undergone erosion in some areas, with modest growth in others. Areas experiencing erosion of industrial land include Bel-Red, Everett's Snohomish Riverfront Redevelopment area, Renton Landing, Seattle's Stadium District, industrial areas of unincorporated Snohomish County between Everett, Mill Creek, and Lynnwood (North Creek), and Auburn Heavy Commercial (this zone includes Emerald Downs, which hasn't had a change of use, but has had its zoning changed to reflect the commercial nature of the activity at the site).

Growth in industrial land supply has taken place in unincorporated areas of Pierce County with CE (Community Employment) designations north of Frederickson, and in newly designated industrial land in Arlington, DuPont, Tacoma and other jurisdictions. See the insets below for a closer look at two changes to the region's industrial land supply.

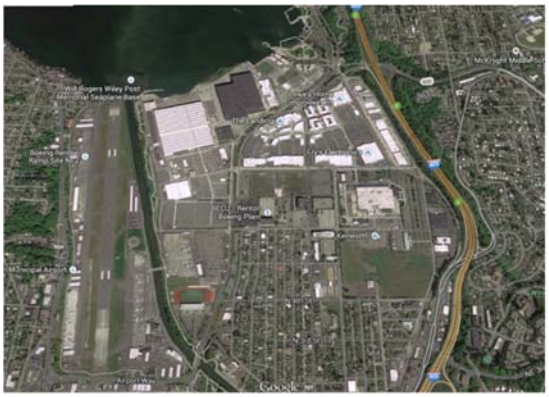
The changes in supply also reflect the inclusion of selected military areas as part of the region's industrial land supply, including parts of Puget Sound Naval Shipyard, Naval Station Everett, Bangor Trident Base and the McChord and Gray Field areas of Joint Base Lewis-McChord. These areas contain industrial employment, including enlisted personnel and civilian contractors. Additionally, smaller areas of several urban planned developments and the Tulalip Indian Reservation were categorized as industrial land than were in 1998. These important changes in methodology account for much of the difference in the land supply figure since 1998.

Exhibit 3.7. Gross Industrial Land Supply in the Central Puget Sound Region, 2013



Land within designated regional MICs seems to have generally retained its industrial zoning. **Exhibit 3.8**, Change in Gross Industrial Land Supply, 1998 and 2013, maps the changes. All of the MICs retained the vast majority of their industrial land. Where change occurred within the MICs, the map mostly shows an infill of industrial zoning within the boundaries, and some small losses of industrial zoning in areas just outside of the boundary.

RENTON LANDING – RENTON, WASHINGTON



The consolidation and reduced footprint of Boeing's activities in Renton led to surplus land available for redevelopment to the southeast of its present airplane factory. Two urban center districts were designated by the City of Renton, and a large mixed-use center (The Landing) was developed on the site.

"Consolidation of Boeing operations may cause certain property located within District One to be deemed surplus, making it available for redevelopment within the near future. District One is envisioned to include a variety of uses."
–City of Renton Comprehensive Plan

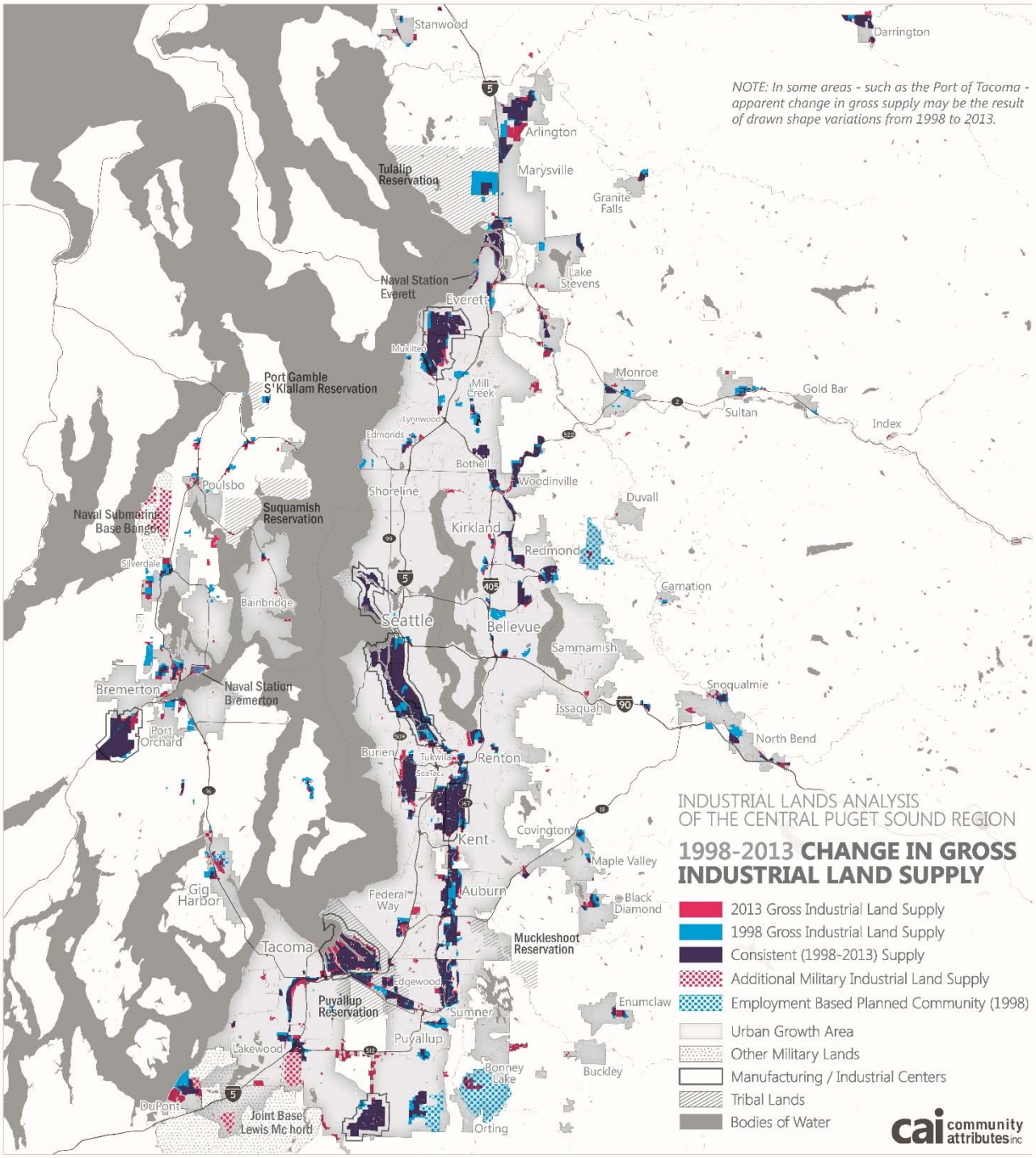
UNINCORPORATED PIERCE COUNTY, WASHINGTON

The industrial and mixed-industrial lands along SR 512 and Canyon Road E in Pierce County are now classified as Employment Centers in the Pierce County Comprehensive Plan (highlighted in red near SR 512 and Portland Avenue, above). Employment Centers are intended to provide accessible, high-paying jobs in manufacturing and related industries. Those businesses are defined by the county's Department of Planning and Land Services as:

"Land intensive type uses such as heavy industrial (e.g., manufacturing, product assembling, fabrication, processing) and heavy trucking are encouraged to locate in the Employment Centers.

Uses such as light manufacturing, assembly and wholesale activities and corporate offices are encouraged to locate in the Employment Centers, especially where they would have less impact on surrounding residential areas in terms of nuisance factors or hazards than would heavy industrial and heavy trucking activities." -Pierce County Department of Planning and Land Services.

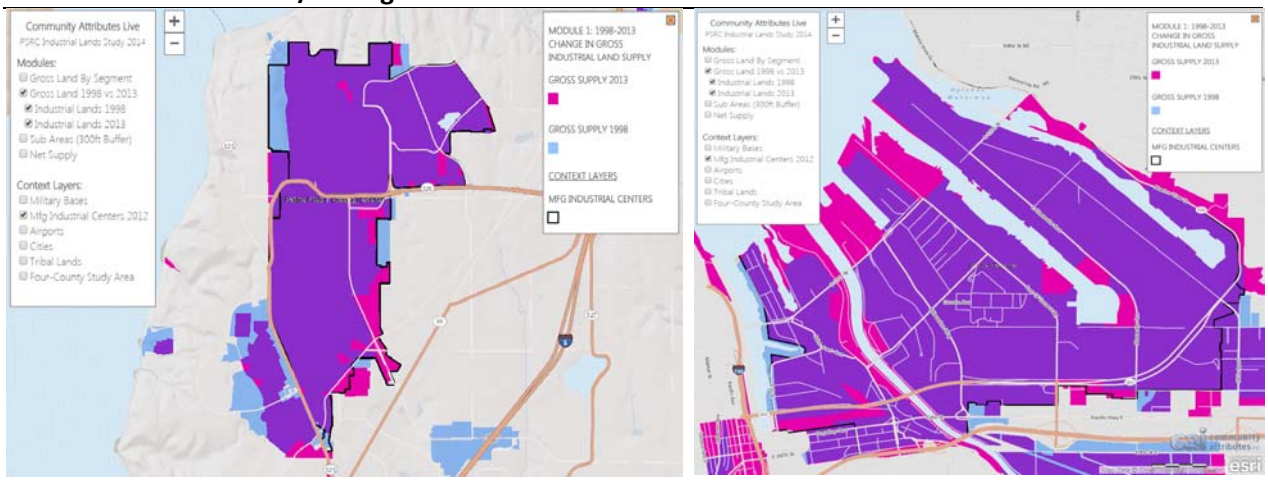
Exhibit 3.8. Change in Gross Industrial Land Supply in the Central Puget Sound Region, 1998-2013



This retention and change is shown in the following illustrative figures in **Exhibit 3.9.** The figure on the left shows that most of the zoning in the Paine Field/Boeing Everett MIC has not changed since 1998 (shown in purple). Where change has occurred, it is mostly an infill of industrial zoning within the boundary (shown in magenta) and some loss of industrial zoned land just outside of the MIC boundary (shown in blue). A similar situation is shown in the figure on the right for the Port of Tacoma MIC.

Exhibit 3.9. Zoning in Paine Field/Boeing Everett MIC and Port of Tacoma MIC, 1998 and 2013

Paine Field/Boeing Everett MIC | **Port of Tacoma MIC**

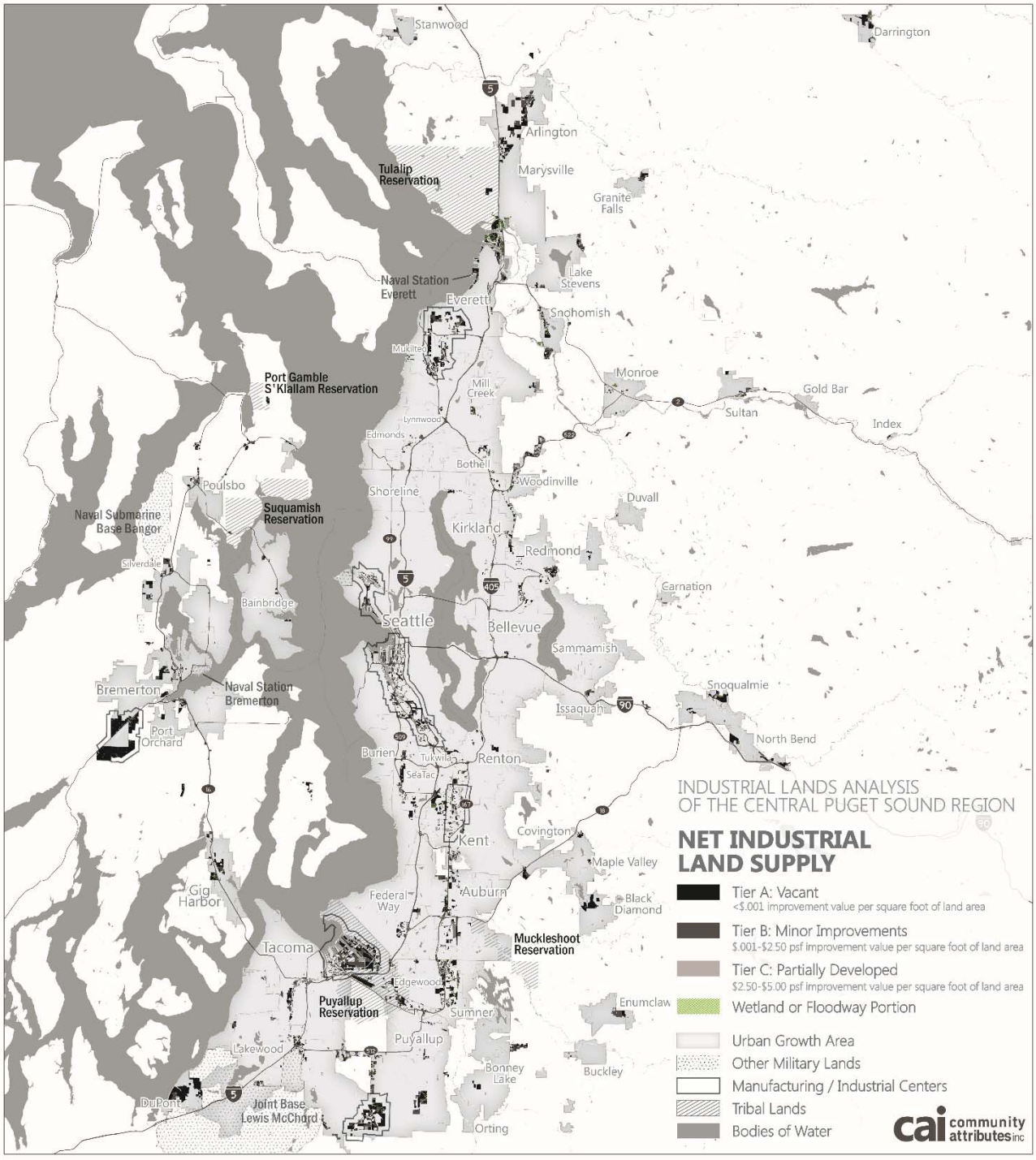


Source: PSRC, 2014.

Net Supply

The net industrial land supply (vacant and physically redevelopable) in the central Puget Sound region is estimated at 28,615 total acres as of 2013 (**Exhibit 3.10**). This figure represents 40% of the region's gross supply. The total amount comprises three tiers of net supply: Tier A lands, those that are vacant, total 17,318 acres (24% of gross supply); Tier B lands, those with minor improvements, total 8,615 acres, or 12% of gross supply; and Tier C lands, those with partial development, comprise 2,681 acres, or 4% of the region's gross supply.

Exhibit 3.10. Net Industrial Land Supply in the Central Puget Sound Region, 2013



REGIONWIDE CONSIDERATIONS

The following considerations affect the availability, characteristics, and adequacy of the region's industrial land supply, and are not reflected in the net supply calculations:

- Infrastructure
- Climate change
- Brownfields
- Environmental justice

These considerations are described below, as well as potential future work to address them in order to preserve and enhance industrial land in the region.

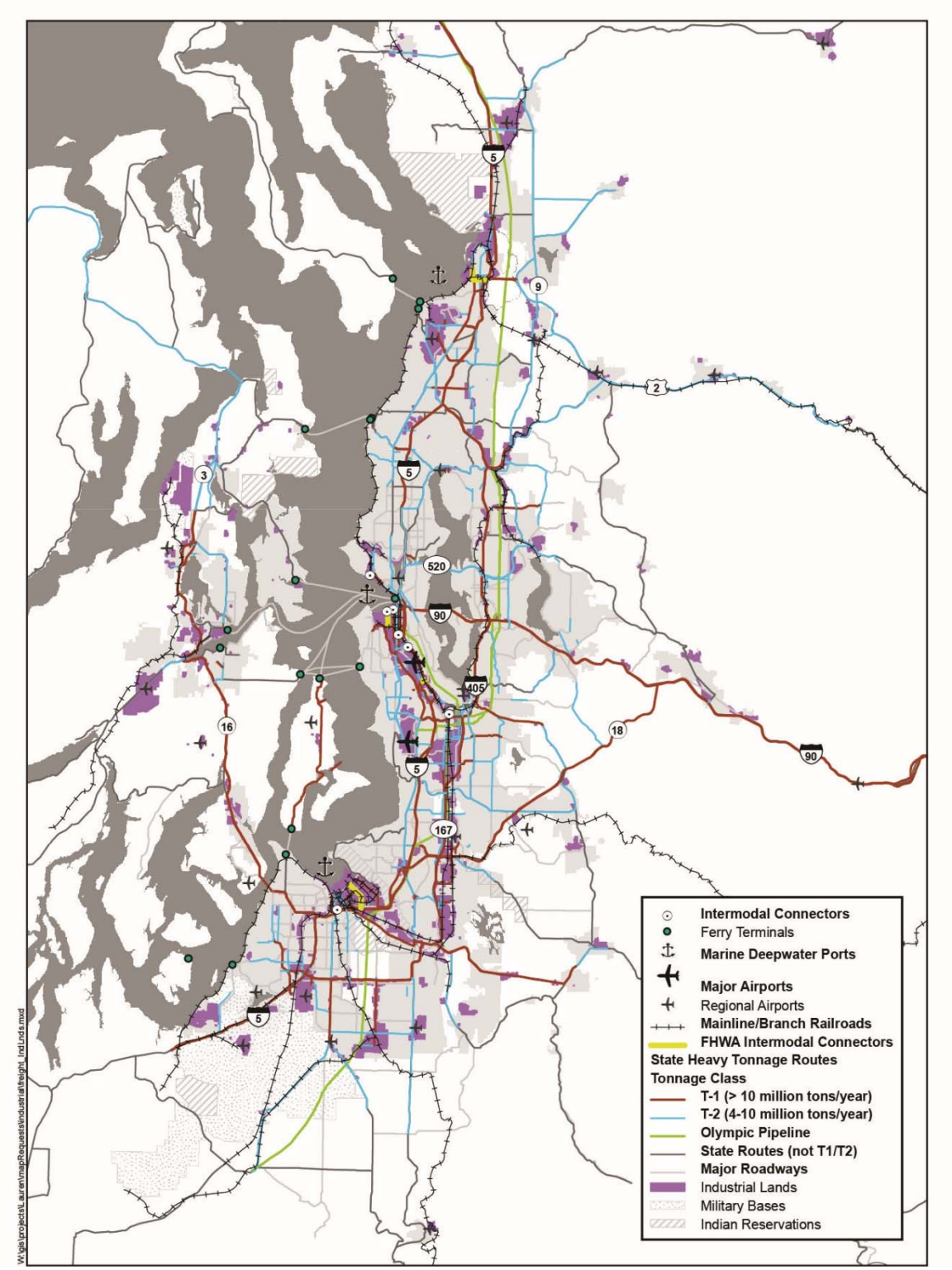
Workforce development, marketing, and other economic development-related strategies are also important considerations that affect the demand for industrial land. Many of these strategies have already been identified in PSRC's Regional Economic Strategy.

Infrastructure

Freight Transportation

Freight transportation is infrastructure for industrial activity, such as seaports, airports, and railroads. It provides important economic and quality-of-life contributions to the regional economy by supporting the daily functions of every business and household in the central Puget Sound region through regional distribution. **Exhibit 3.11** shows major freight transportation infrastructure throughout the region, including rail, deepwater marine ports, airports, pipelines, and roadways. Together, goods movement-dependent industries such as wholesale and retail trade, manufacturing, construction, agriculture, mining, transportation, and warehousing contributed roughly $99 billion to the gross regional product of the metropolitan area in 2013 (roughly 34% of the total gross regional product).[3] These industries provided almost 603,543 jobs in the central Puget Sound region, or roughly 34% of total regional employment. These jobs and employment sectors in the region are dependent on the regional transportation system to bring goods to market.

Exhibit 3.11. Major Freight Transportation Infrastructure Throughout the Central Puget Sound Region



Source: PSRC, 2014.

The region's deepwater ports and air cargo facilities support international and national trade movements that connect international markets to the region and throughout the U.S. Together, the marine and air ports of the central Puget Sound region provide direct and indirect statewide employment to over 200,000 people, contribute almost $1 billion dollars in state and local tax revenues, and generate billions of dollars of revenues through their real estate activities and tenants.[4] The Port of Seattle, Port of Tacoma, and Port of Everett have foreign trade zones which help create employment opportunities by facilitating exports, attracting offshore activity, and encouraging retention of domestic activity. The U.S. Department of Transportation (DOT) is developing the American Marine Highway program, which could further increase the role of marine ports in the freight transportation system.[5]

Rail is another important freight mode. Compared to trucking, it is generally less expensive, and has less impact on traffic congestion and air quality. Rail serving the region includes the Class 1 rail facilities of the Burlington Northern/Santa Fe and the Union Pacific mainlines and intermodal yards, all of which provide vital long-haul rail capacity to feed the needs of international cargo and regional businesses.[6] A number of short line railroads support regional industries by providing short-haul connectivity to markets within and beyond the central Puget Sound region.

In addition to port and rail infrastructure, access to interstates and other major roadway facilities is a critical need for most industrial activities. The Washington State Department of Transportation (WSDOT) prepares the Washington Freight and Goods Transportation System report which classifies all highways, county roads, and city streets by annual gross truck tonnage, ranging from T-1 (the highest tonnage) to T-5 (the least tonnage). The biannual Freight and Goods Transportation System report serves as an inventory of the freight system and is used as a basis for funding eligibility, fulfilling federal reporting requirements, and supporting planning for freight mobility improvements. The main high volume truck freight economic corridors are defined by annual tonnage and include all T-1 (carrying more than 10 million tons per year) and T-2 (carrying 4 to 10 million tons per year) corridors in the state. Also classified as truck freight economic corridors are routes that serve as alternatives to primary cross-state freight routes during severe weather or other disruptions. WSDOT, working with PSRC, the Washington State Freight Plan Technical Teams, Tribes, cities, counties, ports, and many other organizations, has developed objective criteria and defined the state's truck freight economic corridors as[7]:

- High volume, backbone highway infrastructure essential to Washington's economy.

- Critical alternative routes to the main highway freight system.
- Routes that have been identified as first- or last-mile connectors to freight intensive land uses.

This system also includes the national freight network, which was established to assist states in strategically directing resources toward improved system performance for efficient movement of freight on the highway portion of the nation's freight transportation system. This includes the National Highway System, freight intermodal connectors, and aerotropolis transportation systems.[8]

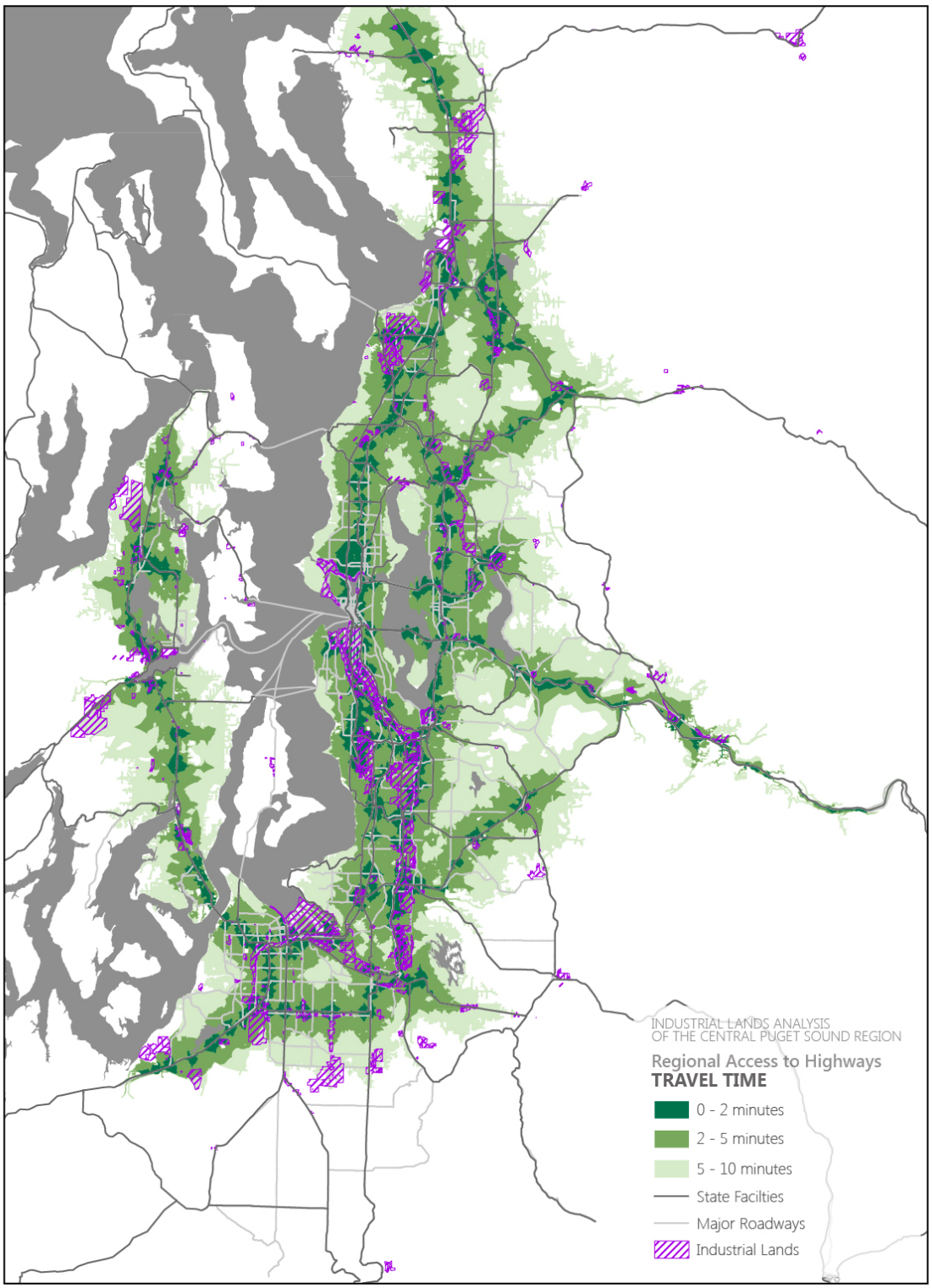
Exhibit 3.12 depicts industrial land access to major roadway facilities by showing distance based on travel time from interstates and highways. Dark green areas have the fastest access to highways, while the white areas are more than 10 minutes from a highway. Most industrial areas in the region are located within five minutes of an interstate or highway. With the exception of parts of PSIC-Bremerton-Sinclair Inlet and Frederickson-Lakewood, the industrial subareas are all within at least 10 minutes of a major facility. Some industrial land in the dispersed category is more than 10 minutes from an interstate or highway.

PSRC has developed a comprehensive, multimodal Regional Freight Strategy that serves as the freight component of the region's long-range transportation plan, Transportation 2040.[9] The Regional Freight Strategy considers all of the main freight modes, including rail, truck, air, and marine cargo, and examines the current and future issues as the region looks to planning for a sustainable transportation system out to 2040. The Regional Freight Strategy has been developed through coordination with member agencies and other regional freight stakeholders. It establishes 23 recommendations across major planning issues brought up in Transportation 2040, including congestion and mobility, safety and security, sustainable funding, maintenance and preservation, and the environment. The Regional Freight Strategy is included as Appendix J of Transportation 2040.

Each industry, freight transportation provider, shipper, or community in the central Puget Sound region experiences a unique set of freight transportation issues and constraints. The Transportation 2040 Regional Freight Strategy identified issues that are starting to affect the movement of freight. These issues are summarized below.

- Increasing congestion on the roads means more wasted truck time, growing transportation costs, and increased emissions from idling on congested facilities. In 2011, congestion in the U.S. resulted in 5.5 billion hours of travel delay, or 38 hours of delay (yearly) per

Exhibit 3.12. Travel Time from Industrial Land to Major Roadway Facilities in the Central Puget Sound Region



Source: PSRC, 2014.

auto commuter.[10] By 2040 the average daily number of trips is projected to increase by 40% for all vehicle types, and there will likely be a corresponding increase in time wasted in congestion for passenger and freight vehicles alike.

- Congestion can create more congestion. As reliability decreases, and congestion increases, many companies send more trucks on the roads to make the same number of deliveries, further adding to the region's problems with congestion.
- Limited Port Connectivity. There are limited arterials and rail lines by which to access the ports, and many of the access facilities are congested or deteriorating. Unless action is taken, this may impact the ability of the ports to operate, or adversely affect the movement of vital regional goods into or out of the port facilities. The Pacific Gateway projects (SR 167 and SR 509 completion to ports) provide potential solutions to this issue.
- Efficient mobility for trucking is also a key issue for the movement of air cargo, where the commodity is usually of high value and shipments are particularly time sensitive. Areas in the region that generate or receive air freight are among the most dependent on connectivity by truck.
- Growing congestion on key freight corridors. Many of the main corridors that help the region to connect to the national system, such as I-5, I-90, and SR 167, are on the list of most congested infrastructure. The completion of SR 509 is expected to provide some relief to I-5 congestion.
- Challenging "Last Mile" Connectivity. In some places, the region's arterial system that serves to connect businesses and homes to the national freight system is deteriorating or congested with passenger vehicles. The ability to access the region's interstates and highways from local facilities that make up the supply chain is an important link that needs to be considered.

In addition, land use planning and design issues were raised. These issues include the erosion of industrial land supply, restrictions on truck delivery times and routes, lack of truck parking areas, and truck routes that don't adequately accommodate truck movements. A more detailed description of freight transportation issues can be found in Section 2 of the Regional Freight Strategy.

Stakeholders in the group interviews conducted for the industrial lands analysis discussed the issues listed above, especially the importance of freight transportation infrastructure to industrial development and the need to make further improvements to the freight transportation system. Specific projects mentioned during the interviews include grade separation of road and rail crossings, the extension of SR 167 and SR 509, and the completion of the Port of Everett Freight Corridor. There was also interest in adding industrial track to improve connection to the rail

system. Interviewees stated that if improvements were made, the region would be more attractive to potential users of industrial lands.

Other stakeholders expressed concern about the increasing competition with residential, commercial, and recreational land uses for land in port areas and along rail corridors considered ideal for freight shipping purposes. This competition has led to reduced availability of land for marine freight and rail freight transport. In some cases, rail and marine freight has been forced to shift to trucks.

Two organizations, the FAST Corridor Partnership and the Washington State Freight Mobility Strategic Investment Board (FMSIB), are particularly effective in helping to implement the Regional Freight Strategy. Both groups have established track records for funding local freight mobility projects with regional, state, and national benefits.

The FAST Corridor Partnership consists of 26 local cities, counties, ports, federal, state and regional transportation agencies, railroads, and trucking interests, intent on solving freight mobility problems with coordinated solutions in the central Puget Sound region.[11] The FAST Corridor team has identified projects and programs to improve freight mobility in the region. Twenty out of 25 projects on the FAST Corridor project list have been completed. The FAST Corridor Partnership remains active and continues to work toward completing the remaining projects, while examining the freight mobility challenges of the future. The FAST Corridor program serves as a national model and could potentially address current and future challenges as funding becomes available.

FMSIB is charged with creating a comprehensive and coordinated state program to facilitate freight movement between and among local, national and international markets.[12] The board also looks for solutions that lessen the impact of the movement of freight on local communities. The board proposes policies, projects, corridors and funding to the Legislature to promote strategic investments in a statewide freight mobility transportation system. Although the FAST Corridor Partnership and FMSIB have excellent track records in helping to implement the Regional Freight Strategy, the effectiveness of these groups is challenged by the lack of stable transportation funding.

Marine Deepwater Ports

The region's natural deepwater ports in Everett, Seattle, and Tacoma provide vital trade links within Washington as well as with the nation and the world. Port terminals cannot be transferred elsewhere in the region, thus are unique industrial areas. Marine ports also support ship building and repair, commercial fishing and naval operations. Maritime industries are a fundamental part of the region's early history and culture; many of the businesses and much of the infrastructure have been established for over a century.

Much of the region's economy depends on the services provided by these ports. A 2014 joint study by the ports of Seattle and Tacoma found that activities related to their combined marine terminal operations were affiliated with $138.1 billion in total economic activity in 2013, accounting for a third of Washington's GDP. The two seaports provided about 18,900 jobs directly and, including both indirect and induced jobs, supported an estimated 48,100 jobs total.[13] Together, these seaports are North America's third-largest container gateway, though the trend towards increasingly larger ships and competition for market share from other West Coast ports challenge Seattle and Tacoma's future vitality. The two ports recently announced a Seaport Alliance in an effort to address these challenges and expand their economic opportunities.

The U.S. Census Bureau Foreign Trade Bureau ranked the Port of Everett's custom district first in Washington for exports, with $22.7 billion in cargo exported in 2013.[14] The local aerospace industry is a substantial economic driver, relying heavily on the seaport for the transport of parts for the 747, 767 and 777 jetliners. According to an independent Martin Associates study, the Port of Everett supports close to 35,000 jobs in the region, and its activities generate around $280 million in state and local taxes.

Deepwater ports and industrial waterfront property require upland support and connections to surface transportation. These port areas have unique infrastructure needs and assets such as piers, rail facilities, pipelines for fuel delivery and cargo distribution and warehousing facilities that support regional industrial activities. Federal, state, and regional agencies, along with the region's ports, railroads, and local jurisdictions, have invested over $600 million in FAST Corridor projects to facilitate the movement of freight.

Over time, some of the land in these port areas has been converted into non-industrial uses. The loss of this limited resource could impact the regional economy, suggesting that these areas may need policies to protect and buffer them from incompatible uses for them to remain viable. Additional challenges include the presence of brownfield sites which limit development.

Water and Sewer

Within the industrial subareas, information was collected regarding existing water and sewer service and adequacy for full development of the industrial areas, assuming typical industrial uses. Most industrial subareas have adequate water and sewer infrastructure for typical industrial uses. However, there are several industrial areas that lack adequate infrastructure. These include the following areas:

- Southeast part of PSIC-Bremerton
- Werner Road industrial area in Bremerton
- Industrial areas on Smith and Spencer Islands in Everett
- Industrial area in northwest Auburn
- Industrial area in the Shaw/East Pioneer neighborhood in Puyallup
- West industrial areas in DuPont

Areas that are served by water and sewer infrastructure, but that need improvements for full industrial development, include the following areas:

- A portion of Thun Field in Pierce County
- The northwest part of PSIC – Bremerton
- The southwest industrial area in the city of SeaTac
- Parts of the southeast Redmond and Overlake areas in Redmond.

Areas that need only developer extensions to individual parcels are considered generally adequate for this study.[15]

Broadband

Over the last decade, broadband Internet needs have rapidly grown for industrial activities. Technological shifts in how products and parts are created, such as additive manufacturing (i.e., 3-D printing), require that companies have Internet readily available. Additionally, traditional manufacturing has begun to incorporate Internet connectivity into its operations, using it to streamline processes, eliminate waste, collect real-time performance data and increase productivity. Only about 10% of companies are using such systems currently, but eventually, as more companies adopt these new technologies, those lacking Internet access will find it more difficult to compete.[16]

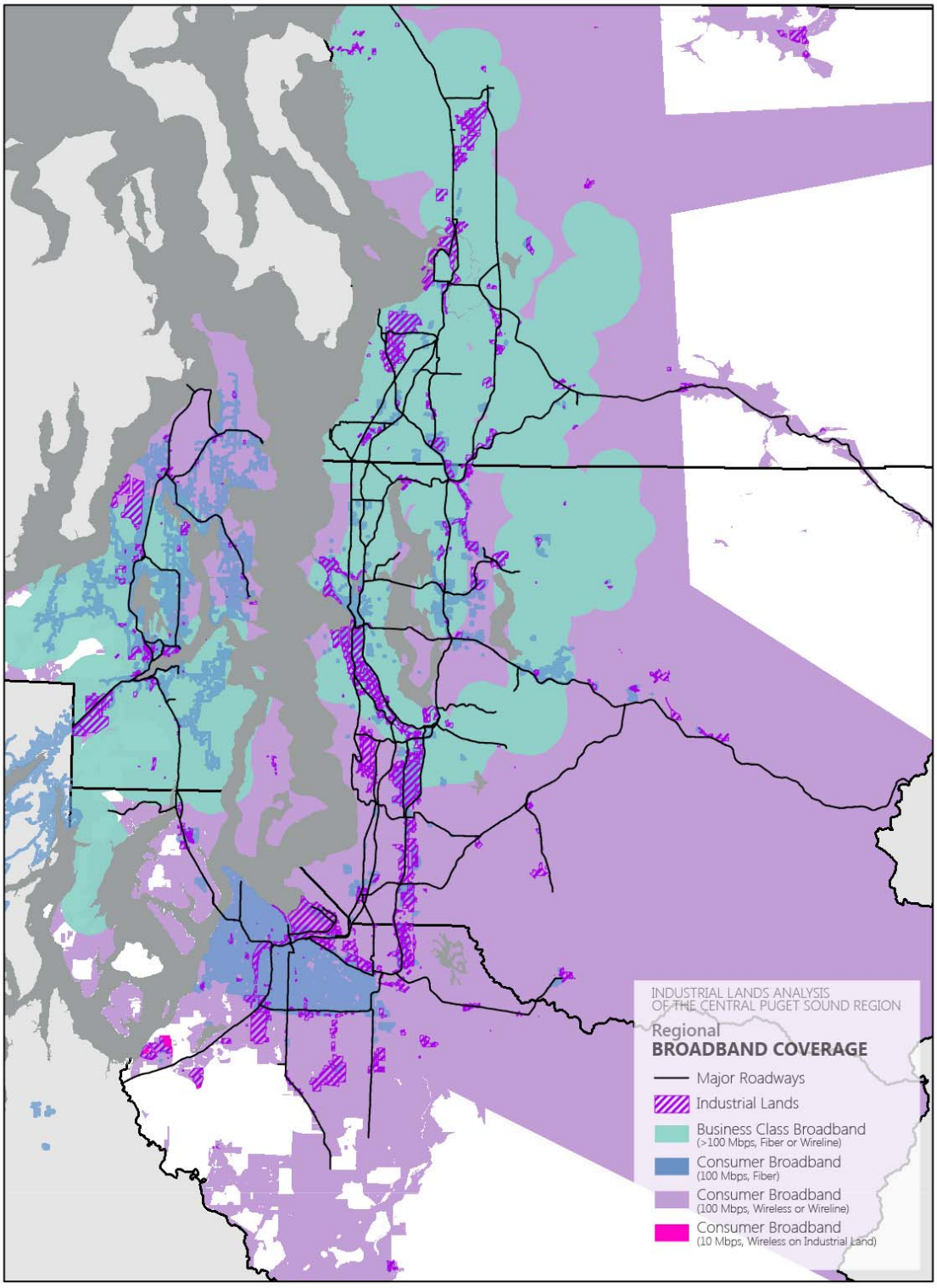
Access to broadband is considered an important economic development tool for encouraging manufacturing. Broadband service that is considered adequate for industrial activity has a speed of 100 megabits per second (Mbps) or greater and is ideally provided by fiber-optic cable, which is preferable to copper wire due to its durability and ability to handle higher speeds.[17]

Exhibit 3.13 shows broadband coverage for the region from the Washington State Broadband Office. Most industrial areas in the region have access to business-class broadband, either immediately or with some lead time. Business-class broadband is adequate for industrial users because it has speeds of 100 Mbps or more, can be either fiber-optic cable or wireline, and offers a service level agreement. For the industrial areas where business-class broadband is unavailable, almost all have access to relatively high-speed (100 Mbps) consumer-grade broadband.

This level of broadband service is adequate for most industrial users, especially areas served by fiber-optic cable. **Exhibit 3.13** indicates that only industrial areas in the City of DuPont have broadband service speeds at or less than 10 Mbps, which would not be adequate for many industrial activities.

Although the broadband map shows that most industrial land in the region has adequate broadband access, comments from stakeholders indicate that many properties do not have adequate broadband service. In many cases this is due to lack of financing for connecting broadband from the property line to the end user. Broadband financing tools may help with this issue. In addition, including fiber and other broadband infrastructure should be considered during development and redevelopment of a site because the installation cost is significantly lower when trenches are open. Tracking broadband service levels and the needs for targeted industries will help ensure industrial areas have adequate broadband service.

Exhibit 3.13. Broadband Coverage in the Puget Sound Region, 2014



Source: Washington State Broadband Office, PSRC, 2014.

Climate Change

Climate change refers to the alteration of the global atmosphere attributed to human activity compared to natural climate variability.[18] Climate change is predicted to have increasingly adverse effects, particularly to industrial land at low elevations and in floodplains. Both adaptation to and mitigation for climate change should be addressed to reduce the impact of these effects.

The University of Washington's Climate Impacts Group completed a comprehensive assessment of the impacts of climate change on Washington. Using global climate models scaled to the Pacific Northwest, the assessment projects that Washington is likely to experience higher temperatures, enhanced seasonal precipitation patterns, declining snowpack, seasonal changes in stream flow, sea level rise, increase in wave heights, warmer sea surface temperature and ocean acidification.[19] Expected adverse effects on infrastructure and the built environment resulting from those changes include the following:

- Sea level rise and storm surge will increase the risk of flooding, erosion and damage to coastal infrastructure. Rising sea levels will lead to a reduction in marine industrial land supply in some areas.
- More extreme precipitation will increase the risk of flooding, landslides and erosion, which may damage or disrupt infrastructure systems and overwhelm drainage structures.
- Warmer temperatures and heat waves could strain energy and transportation systems—though they also offer benefits such as reduced snow and ice removal costs.
- Prolonged low summer flows could affect river navigation.
- Lower summer streamflow will reduce summer hydropower production at a time when warmer temperatures will increase electricity demand for cooling.
- Larger and more intense forest fires could damage buildings, roads and other infrastructure.

The Washington State Department of Ecology (Ecology) is the primary state agency working on climate issues and has responsibility for the oversight of shoreline management. Ecology's webpage on Sea Level Rise and Coastal Hazards has reports, resources, and mapping and visualization tools.[20] Appendix L of Transportation 2040, the region's action plan for transportation in the central Puget Sound region, includes sea level rise maps based on data from 2008.[21] Municipal Research and Services Center (MRSC) also has many resources such as maps showing affected shoreline areas, FEMA floodplain maps, visualization tools and guidance manuals.

Several Washington communities have begun to consider sea level rise in their comprehensive plans, shoreline master programs, climate action

plans, hazard mitigation plans, and other functional plans and programs.[22] For example, King County has assessed the vulnerability of major wastewater facilities to flooding from sea level rise and has included adaptation policies in its Strategic Climate Action Plan. In the *Gorst Watershed Subarea Plan*, Bremerton and Kitsap County recommend adaptation measures to account for sea level rise in the design of buildings, impervious areas, and roadway, flood management, and utility facilities. Recommendations for adapting to climate change and sea level rise could involve limiting new development in highly vulnerable areas and promoting new sustainable development in appropriate non-vulnerable areas. Additional recommendations are provided on MRSC's website.

Climate change mitigation refers to reducing greenhouse gas emissions and absorbing carbon. Industrial processes and energy use account for approximately 20% of greenhouse gas emissions in Washington and 28% nationally.[23,24] Because Washington uses hydropower for much of its electricity, the industrial greenhouse gas emissions are less in Washington than in other states.

EPA has identified strategies that industry can take to help mitigate climate change impacts.[25] For example, co-locating industries whose waste products can become inputs for another's process can minimize waste and transport. Similarly, efficient transportation for employees, inputs and products can reduce greenhouse gas emissions. Switching to fuels that produce less CO_2 emissions but provide the same amount of energy can also reduce greenhouse gas emissions. Where industrial areas are not already connected to energy infrastructure, decentralized, renewable energy sources such as solar or wind power can be more affordable.

Washington Governor Jay Inslee signed an Executive Order in 2014 outlining a series of steps to cut carbon pollution in Washington and advance development and use of clean energy technologies.[26] Several components of this Executive Order could eventually affect users and managers of industrial land in the region, creating both opportunities and challenges. The action plan in the Executive Order has six main elements:

- Reduce carbon emissions through a new cap-and-market program.
- End use of electricity generated by coal.
- Develop clean transportation options and cleaner fuels.
- Accelerate development and deployment of clean energy technology.
- Improve building energy efficiency.
- Reduce state government's carbon footprint.

These elements are similar to federal initiatives to address climate change, as listed in the United States' Climate Action Plan.[27] Climate action plans and similar documents have been developed at all scales, from the United Nations to local jurisdictions. These climate change policies and programs, as well as the evolving research on the effects of and adaptation to climate change, should be monitored and considered in planning for industrial lands.

Brownfields

Brownfields are real property where expansion, redevelopment or reuse may be complicated by the presence, or potential presence, of hazardous substances.[28] A long history of industrial use sometimes leaves sites with contaminants that present risk to public health and safety. While many of these sites have been cleaned up, others still have confirmed or suspected contaminants. Unless otherwise documented, the property owner is liable for the contamination on the site.

Exhibit 3.14 presents brownfield sites identified as awaiting cleanup or undergoing cleanup that are currently receiving some type of public assistance, such as grants and loans, to defray assessment and remediation costs. The exhibit does not show brownfields sites that have already been remediated. Superfund is the federal government's program to clean up the nation's uncontrolled hazardous waste sites. Seattle's Lower Duwamish Waterway and Tacoma's Middle Waterway are just two of many Superfund sites in the region.

Exhibit 3.14 also illustrates suspected sites, which are sites with known or suspected environmental hazards. These sites have not received public assistance with assessment or cleanup, and the levels of contamination are unknown. The remediation of some of them is governed through environmental covenants, such as containing an area of environmental risk by paving over it for use as a parking lot or a concrete slab to serve as part of a building's foundation. Some of these suspected sites may have already been cleaned up, but the property owners may have decided that the cost and complexity of removing them from the list outweighed the benefits of removing the brownfield designation. While there are many suspected sites, many sites are on this list because the contamination is not severe enough to require public funding to clean them up. However, some of these sites may not have received enough assessment to know that they have severe contamination. Furthermore, other contaminated sites yet to be identified and/or assessed may exist.

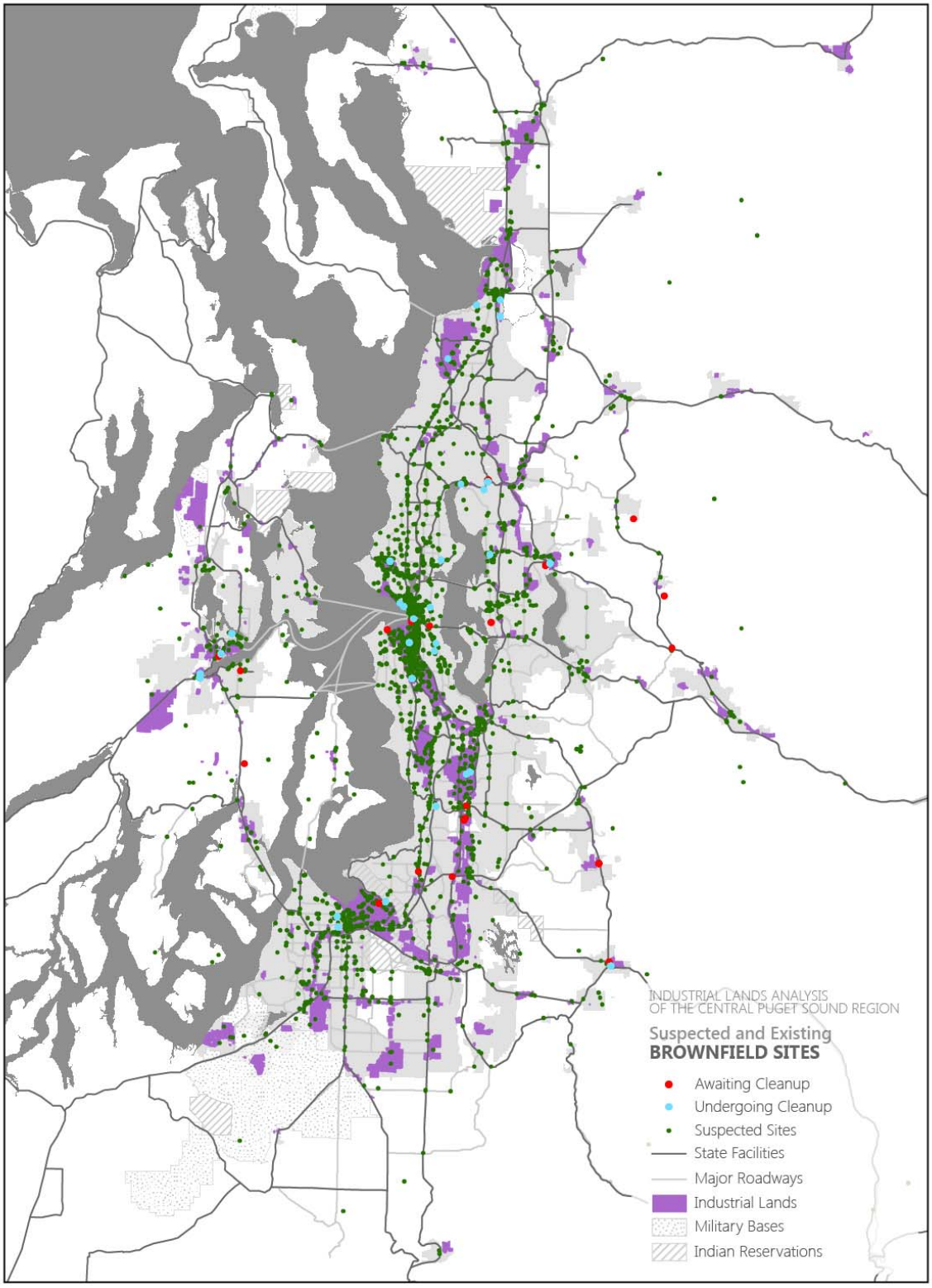
Cleaning up and reinvesting in these properties protects the environment, reduces blight and eases development pressures on greenfields, forests and farmlands. Additionally, it enables new development to use existing infrastructure and takes advantage of existing access to waterways, major

highways and railroads. Commercial and industrial redevelopment often generates revenues sufficient to cover a site's remediation costs.

Brownfields can be difficult to redevelop because the current owner may have trouble finding a buyer. Depending on the severity of the contamination, an otherwise willing buyer may have trouble finding the financing necessary to purchase the property. The extent to which contamination is a major barrier to industrial redevelopment in the region is unknown. About 28% of contaminated sites shown on Exhibit 3.14 (awaiting cleanup, undergoing cleanup and suspected sites) are located on industrial land.

Washington has a cooperative approach to brownfields cleanup and redevelopment.[29] Technical assistance, grants and a revolving loan program are available through state agencies and private consultants. The Department of Ecology manages cleanups under the Model Toxics Control Act and administers cleanup grants. The Department of Commerce manages the Brownfields Revolving Loan Fund and provides technical assistance to parties interested in redeveloping. Commerce also provides other revitalization grants and loans. Ecology and Commerce work closely with the Environmental Protection Agency's brownfields staff and routinely collaborate on strategies to assist communities. EPA also works directly with some property owners. Gaining a better understanding of how to leverage brownfields assistance programs could help with brownfields cleanup efforts in the region.

Exhibit 3.14. Suspected and Existing Brownfield Sites in the Puget Sound Region, 2014



Sources: Ecology,[30] PSRC, 2014.

Environmental Justice

Since the mid-1990s, a renewed emphasis on environmental justice has become an integral part of the planning process for urban regions in the United States. The concept of "environmental justice," derived from Title VI of the Civil Rights Act of 1964 and other civil rights statutes, was reemphasized as a national policy goal by presidential Executive Order 12898, issued in 1994.[31] The Executive Order directs "each federal agency to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

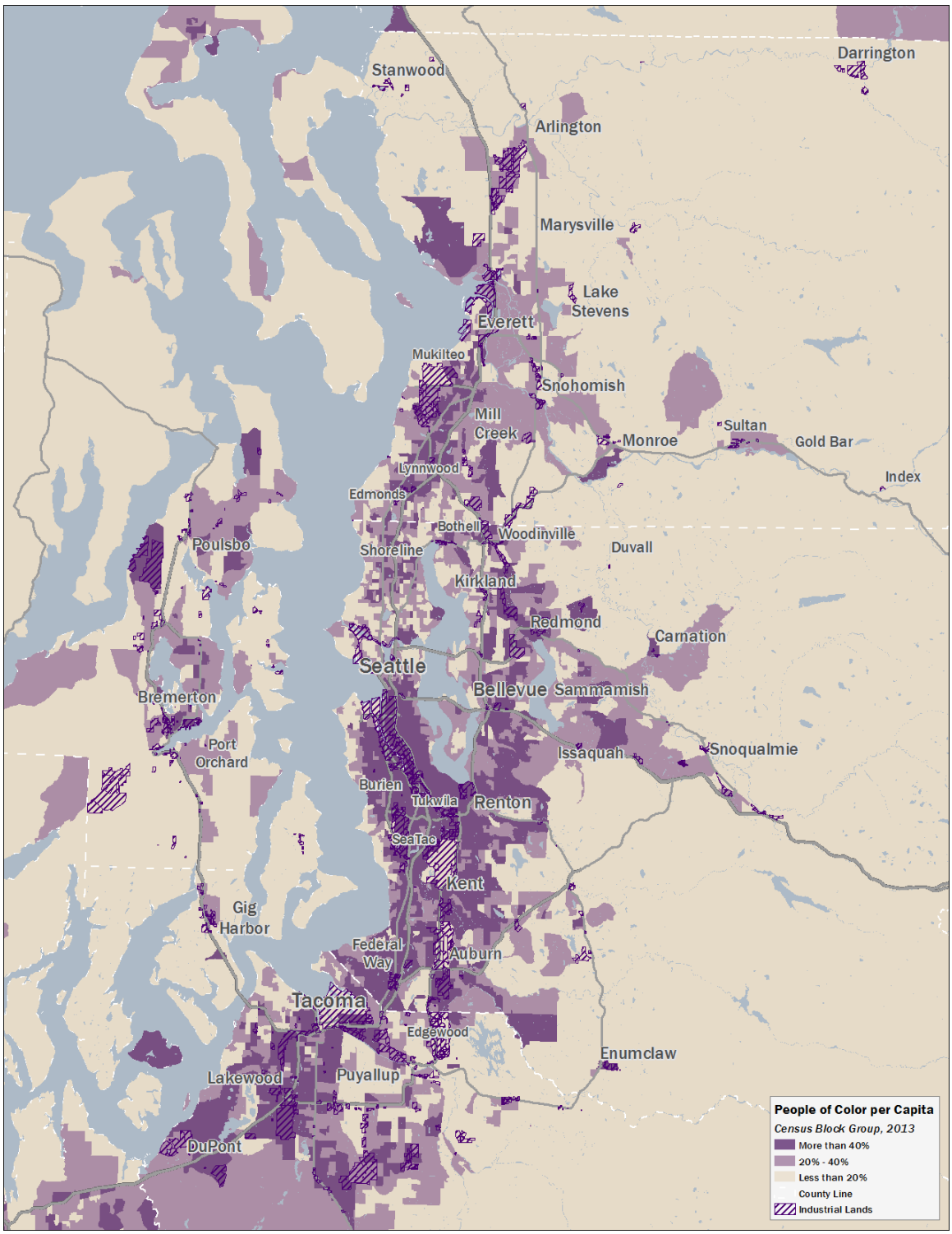
Minorities, or non-White persons including White persons of Hispanic/Latino origin, comprised 31.2% of the region's total population in 2010. [32] Minorities comprised the largest share of the population in King County (35.2%), followed by Pierce County (29.7%), Snohomish County (25.7%), and Kitsap County (20.9%), Blacks/African Americans constituted 5.4% of the region's total population, American Indians/Alaskan Natives 1.1%, Asians/Pacific Islanders 11.8%, and Hispanics/Latinos 8.8%.

Understanding the demographics of the region is a first step in considering environmental justice. In 2010, the regionwide poverty rate was 11.7%. The poverty rate was higher in King County (12.2%) and Pierce County (20.0%) and lower in Kitsap County (11.3%) and Snohomish County (9.9%).

Exhibits 3.15 and 3.16 compare the location of industrial lands to the regional rates of minority populations (people of color) and low-income populations (households in poverty). Just over half (52%) of industrial lands in the region are in census tracts where the percentage of people of color is greater than 32%. About a fifth of the region's industrial lands (20%) are in census tracts where the percentage of households in poverty is greater than 11.7%.

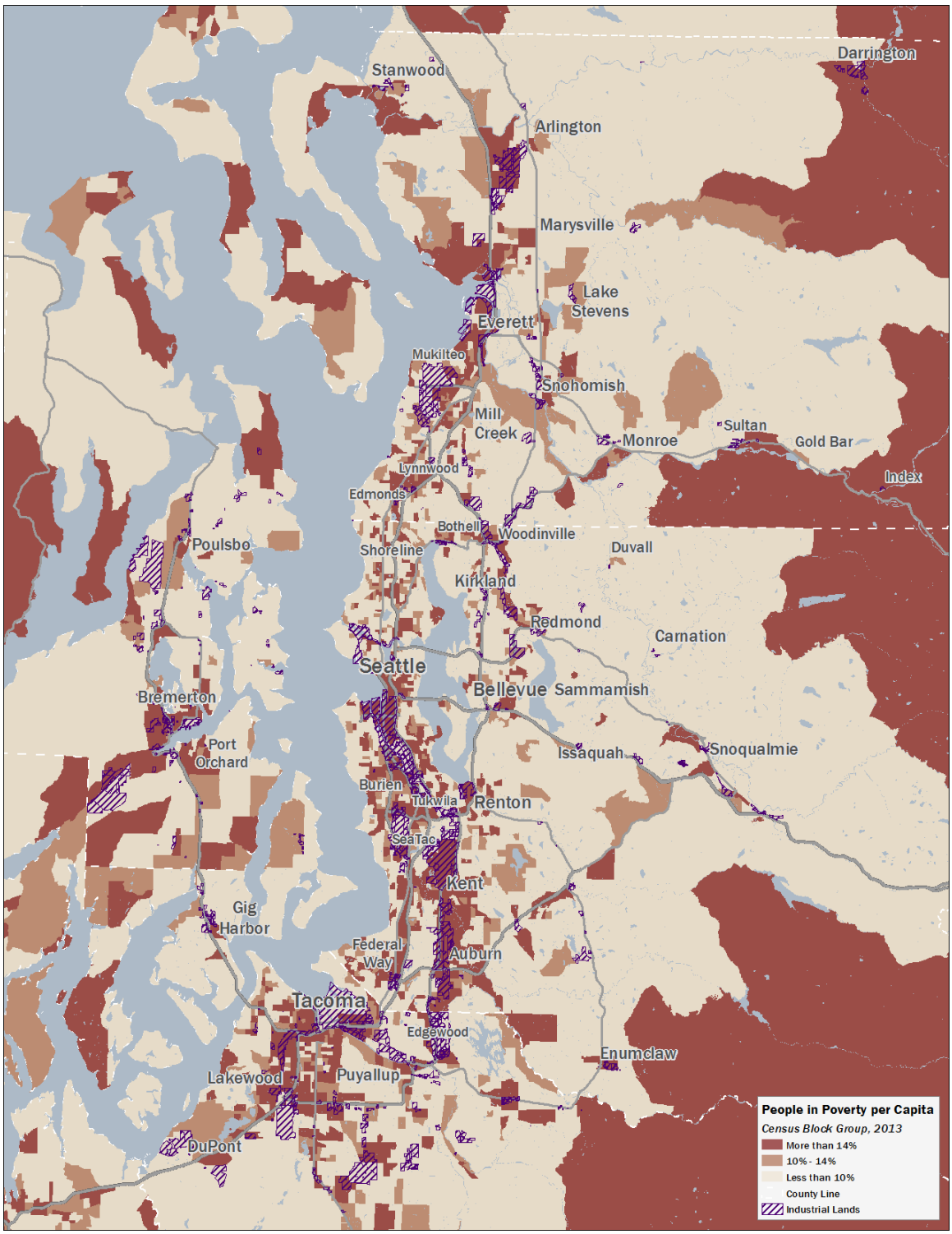
Living near industrial lands could have both advantages and disadvantages. On one hand, living near industrial land could result in exposure to negative environmental effects such as noise, glare, dust, and odors. On the other hand, living near industrial land could also provide close access to job opportunities. This high-level analysis indicates that minority populations may have a high likelihood of living near industrial lands. Gaining a better understanding of the environmental effects, job opportunities, and transit access in specific industrial areas would help identify potential effects to environmental justice populations, as well as strategies to mitigate effects and increase benefits.

Exhibit 3.15. Minority Population Rates Per Capita and Industrial Lands in the Central Puget Sound Region, 2013



Sources: U.S. Census 2010, PSRC 2014.

Exhibit 3.16. Persons in Poverty Per Capita and Industrial Lands in the Central Puget Sound Region, 2013



Sources: U.S. Census 2010, PSRC 2014.

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