Industrial Land and Jobs Study

Executive Summary

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TABLE OF CONTENTS

I. Introduction
II. Characterizing the Demand for and Supply of Industrial Land
III. The Conversion of Industrially Zoned Land
IV. Future Demand for and Supply of Industrially Zoned Land
V. Impacts of changes in industrial employment on job quality
VI. What do businesses want? Results of business voice survey and interviews
VII. Potential considerations for the retention and conversion of industrial land

I. INTRODUCTION

The Industrial Land and Jobs Study complements the 2015 MTC Goods Movement Needs Assessment with an analysis of the demand for and supply of industrially zoned land in the nine-county region, both now and in the future. The study was conducted by UC-Berkeley and funded by Caltrans, via the University of California Transportation Center. Throughout the course of the study, UC-Berkeley researchers coordinated closely with the staff of the Association of Bay Area Governments, as well as a Technical Advisory Committee consisting of city officials in economic development and planning, as well as business associations focused on industrial businesses or real estate.

II. CHARACTERIZING THE DEMAND FOR AND SUPPLY OF INDUSTRIAL LAND

The demand for industrial land

Interviews with 12 experts in real estate and logistics, and a review of earlier studies provided an overview of existing demand for industrial space and how it may change. The overall demand for warehousing space is increasing dramatically due to the rise of just-in-time delivery. This has led in two divergent directions. Closer to dense urban centers, the trend in warehousing is toward demand for smaller spaces. Yet large warehouses generally located further away from the urban core are still in demand for e-commerce giants. Manufacturing

employment demand is growing more gradually, but the need for space continues with existing, expanding or new firms, in varied location types. Trends in the maker movement, sustainability, technology, and productivity create a demand for smaller spaces, particularly in the urban core. More centralized locations close to customers are also an advantage for businesses that service other industries (e.g., repair shops, machining). To the extent that manufacturing firms are starting to in-source employment that had been headed offshore, demand would be for land in the less built-out parts of the region. Finally, for many businesses, transport and shipping needs are generally demanding more space in more urbanized areas, for both loading and parking.

The supply of industrial land

Another goal of the study was to determine the *supply of industrially zoned land* in the nine-county Bay Area. The nine-county region has almost 98,000 acres of industrially zoned land, of which we estimate 6,780 acres is vacant (Table 1 and Figure 1). The study categorizes industrially zoned land as either mixed-use (allowing office, commercial, or residential as of right), or exclusive industrial (allowing only light, medium, heavy, or transportation uses). Notable differences among sub-regions are the concentration of heavy industrial land in the East Bay, the reliance on mixed-use commercial zones in the Peninsula, and in general, the mixture of industrial and office uses (hereafter called industrial-office) in both the Peninsula and the South Bay. Alameda County has the most industrial land, followed by Contra Costa, Santa Clara, and Solano. Yet, despite this concentration, market activity is largely concentrated in San Francisco and Santa Clara counties.

Table 1. *Amount and distribution of industrial land in the Bay Area**

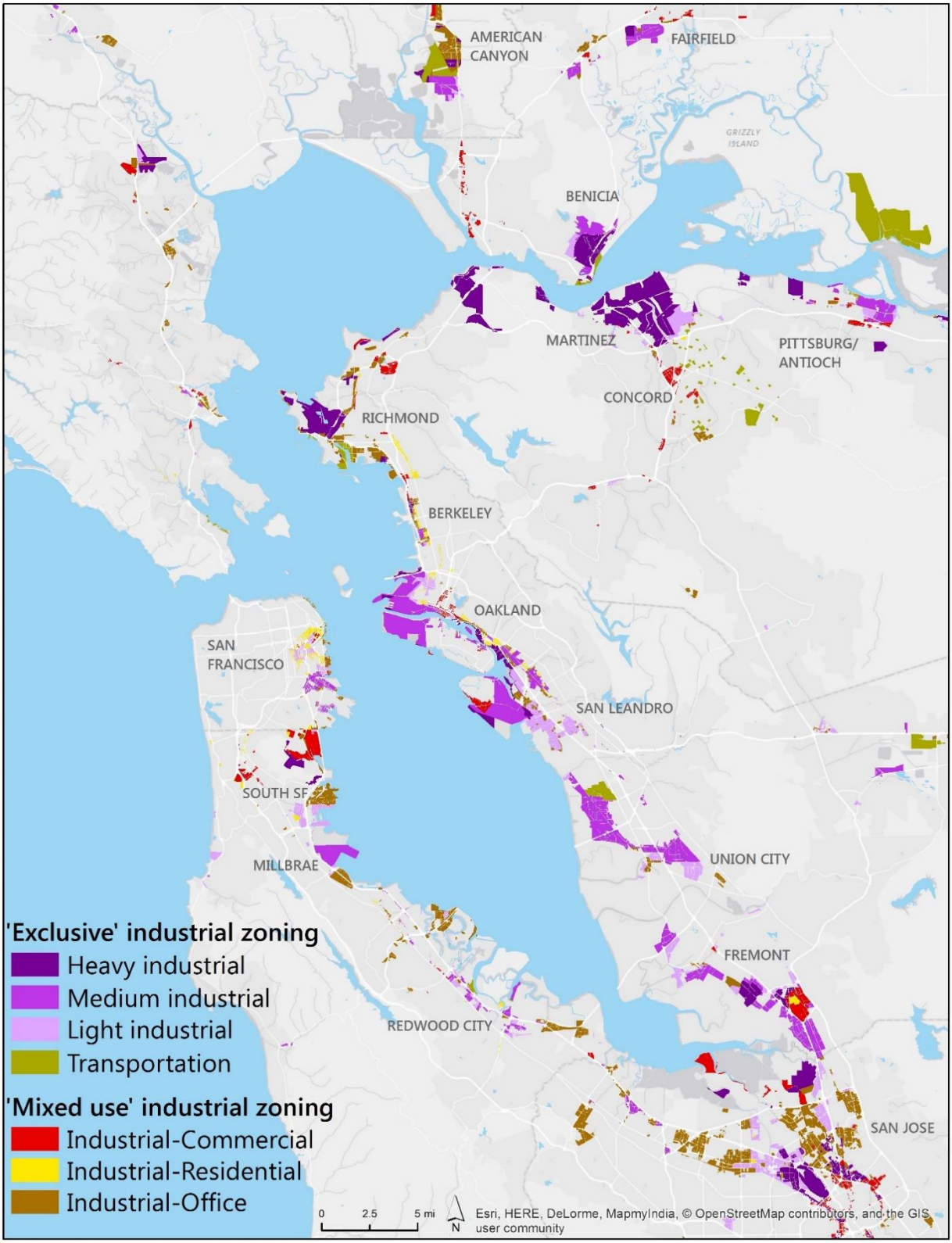
	Total Land in County (acres)	Total Industrial Land (acres)	Exclusive Industrial Land (acres)	Vacant Industrial Land (acres)+	Percent Industrial Land of Total Land
East Bay					
Alameda	476,064	24,192	20,656	578	5.10%
Contra Costa	477,745	20,206	16,237	2,012	4.20%
West Bay					
San Mateo	291,520	10,845	646	0	3.70%
San Francisco	30,427	1,971	972	0	6.50%
South Bay					
Santa Clara	830,787	18,501	2,395	145	2.20%
North Bay					
Solano	543,426	14,432	986	2764	2.70%
Napa	504,137	3,931	6,240	997	0.80%
Sonoma	1,016,546	1,996	8,662	170	0.20%
Marin	337,158	1,750	9,975	115	0.50%
Total	**4,507,811**	**97,823**	**66,769**	**6,781**	**2.20%**

Source: County Assessors' DataQuick Database; See Technical Memo #1: Industrial Land Supply and Demand for notes on how total acreage was calculated

** Calculations based on gross regional land area.*

+ Estimated based on use code VIND (vacant industrial) in county tax assessor database.

Figure 1. *Industrial land by zoning classification.*

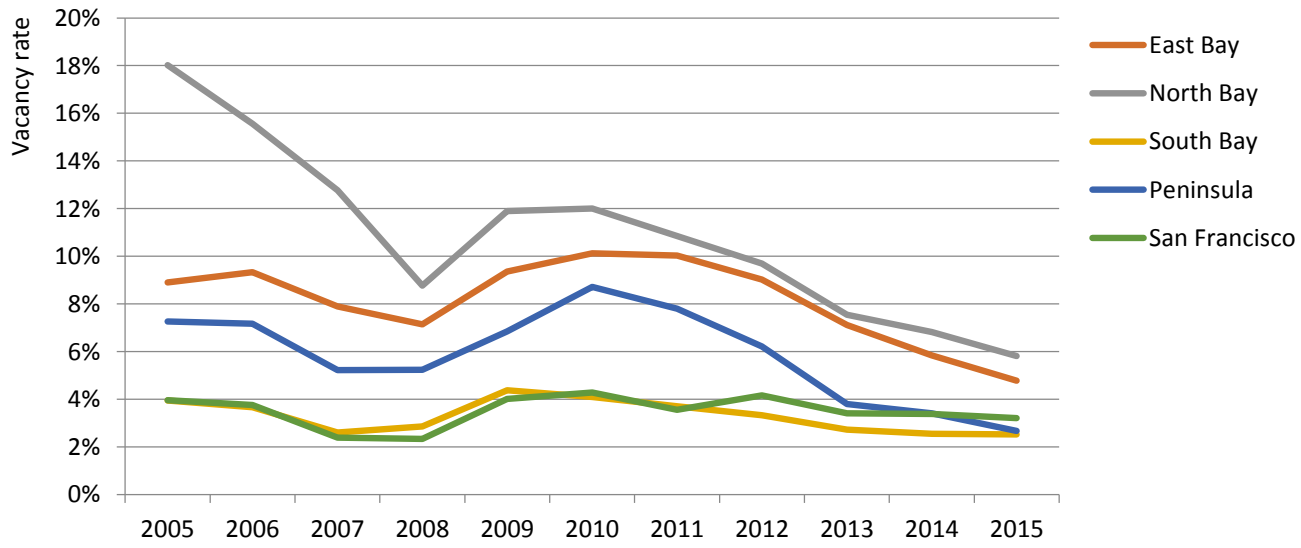


Source: See Technical Memo #1: Industrial Land Supply and Demand.

Buildings on industrial land

Statistics on industrial space marketed through commercial brokers provide indicators of how industrial land is used and space availability. Outside of San Francisco, much of the Bay Area's industrial land is occupied at very low densities, perhaps to accommodate parking, loading, and other surface uses. Warehouses comprise half of the region's leased stock tracked by CB Richard Ellis, with R&D comprising another 30%. Warehouse development dominates in every sub-region except the South Bay, where R&D is concentrated. New construction is occurring mostly in the East and North Bay. There is a significant amount of older stock, particularly in San Francisco, Alameda, San Mateo, and Marin counties, some of which may be appropriate for demolition and reuse. Rents are generally high and have recovered from the recession, particularly in San Francisco and the Peninsula, and for R&D. Vacancy rates are now reaching historic lows; the exception is R&D in the East and North Bay, which continues to experience vacancy rates of about 10% (Figure 2).

Figure 2. *Vacancy rates for industrial buildings, 2005 -2015*

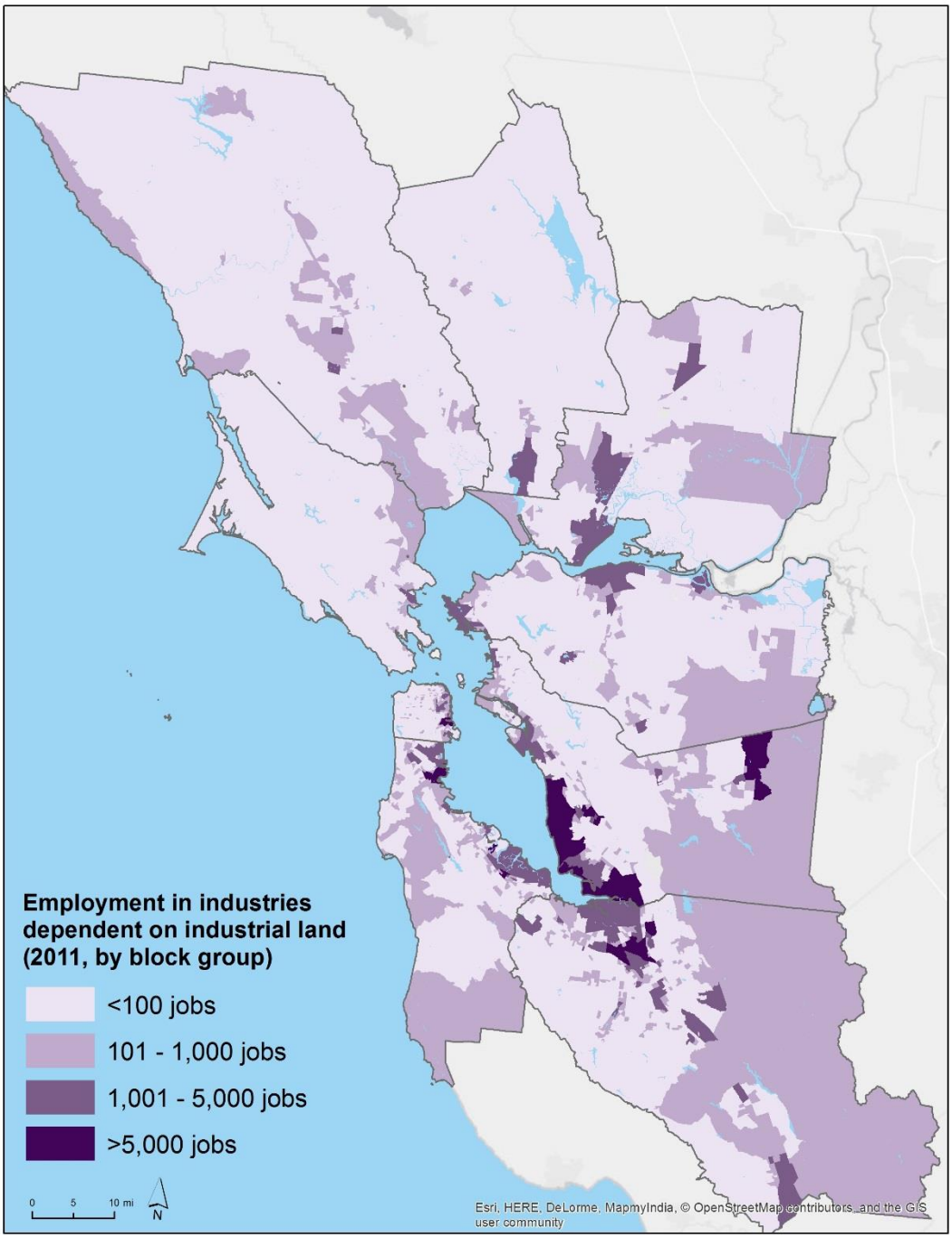


Source: CBRE; See Technical Memo #1: Industrial Land Supply and Demand.

Business trends on industrially zoned land

We defined industries as highly dependent on exclusive industrial zoning based on the location quotient, which measures the concentration of industries in a particular area relative to the larger reference region within which it sits (in this case, California). Figure 3 maps the sum of Dun & Bradstreet/NETS employment (for 2011) by block group. The greatest concentrations of employment dependent on industrial land occur in southern Alameda County (from San Leandro to Fremont) and northern Santa Clara County (primarily San Jose). Other concentrations occur near the San Francisco Airport, along the Northern Waterfront, and near Livermore. These concentrations suggest where the region might want to consider more stringent protections or proactive policies for industrial land and firms in the future, in order to support regional economic growth.

Figure 3. *Employment in industries dependent on exclusive industrial land.*



*Source: See Technical Memo #1: Industrial Land Supply and Demand***.**

*Note: Block groups vary in size based on population density: smaller in dense areas, larger in less dense areas, which may distort the map.

The demand for industrially zoned land varies by sub-region. In general, mixed-use industrial land is in demand from businesses that are compatible with other users, while exclusive industrially zoned areas are required for businesses with externalities of noise and traffic. In the South Bay, high-tech manufacturers, as well as building

contractors, are concentrated on mixed-use land (typically permitting office as well as industrial uses). On exclusive industrial land is where heavier users such as machine shops and other manufacturers, often suppliers to high-tech, are found. In the East Bay, the industrial clusters are quite different. Light manufacturing, contractors, and solid waste collection are concentrated on mixed-use land, while heavy manufacturing, trucking and logistics tend towards exclusive industrial zones. The North Bay hosts light manufacturing like quick printing or metalworking, as well as wholesaling, on its mixed-use industrial land, while businesses such as contractors and industrial suppliers tend to locate on the exclusive industrial land. San Francisco is quite unique, with service industries such as software, publishing, and advertising on mixed-use land, while sectors such as construction, communications, and auto repair tend to locate on exclusive industrial land.

III. THE CONVERSION OF INDUSTRIALLY ZONED LAND

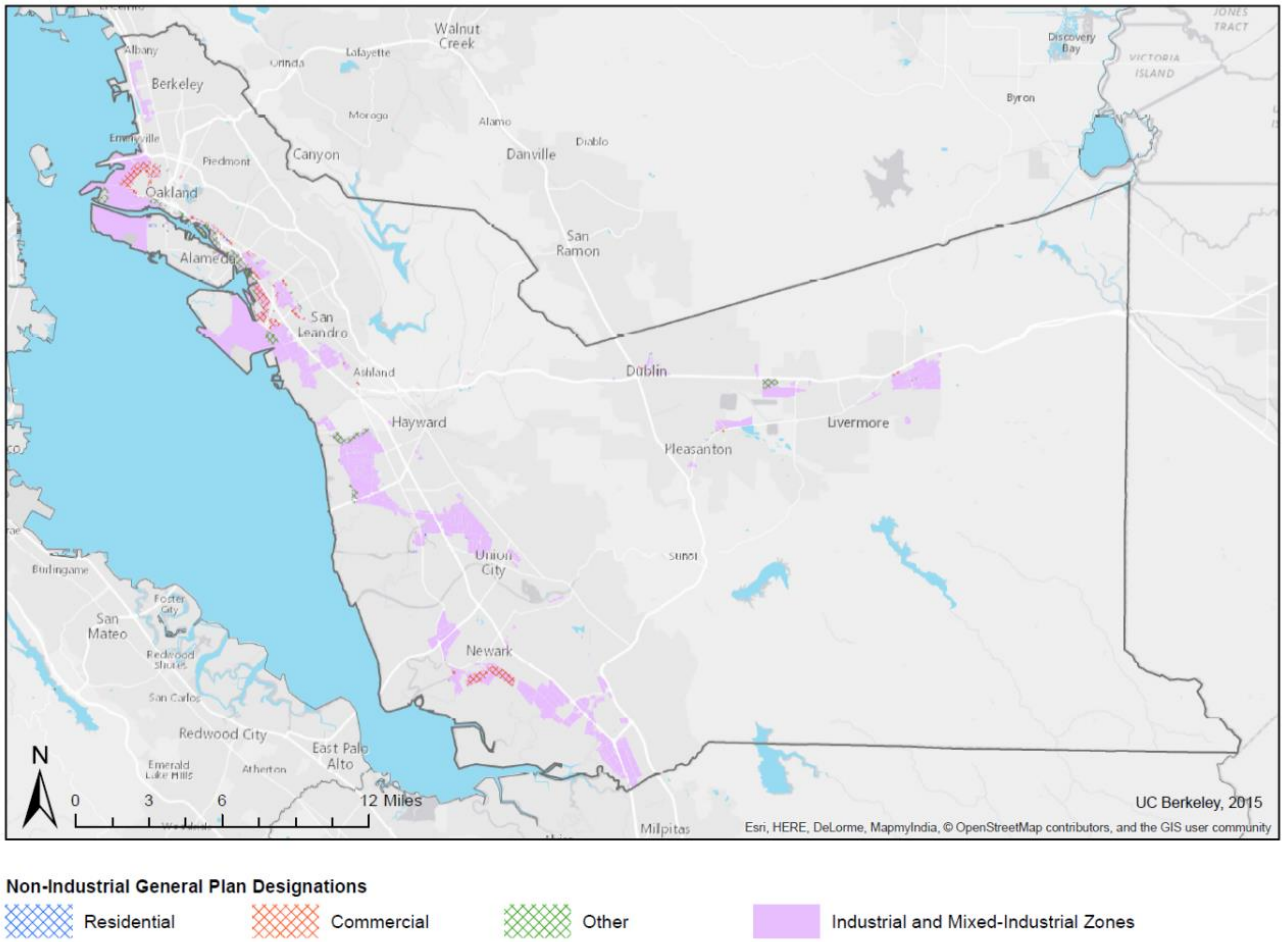
Next, the study assessed how much industrially zoned land has already been converted, how much is likely to be converted in the near future, and whether there is likely to be sufficient industrial land to accommodate demand in 2040.

Overall, a small but significant share of exclusive industrial land (i.e. industrial land that does not allow mixed-use or office) has been converted to other uses. Our fieldwork estimated that 10% of industrial land had been converted, but an analysis of assessor data suggested a lower conversion rate, about 1% over a six year period. There has been little encroachment of new housing on exclusive industrial land: in the cities where it is most likely, San Jose and Oakland, about 1-3% of units have been built on industrial land.

Overall, about 7% of the industrially zoned land in the region is vacant. However, vacancy varies throughout the region, with very little vacant acreage in the urban core, and large reservoirs of industrial land in the North Bay.

This analysis also examines the extent to which industrially zoned land is designated for other uses according to the general plan, or overlaps with Priority Development Area (PDA) designation. This land would be more easily converted to other uses. In the nine-County Bay Area region, a total of 15,084 acres of industrial land are in categories that would allow conversion to non-industrial uses, comprising about 17% of current industrial zones. The percentage of industrial land susceptible to conversion varies significantly across the different counties. In Napa County, which has a small share of the region's industrial land, only 1% is susceptible to conversion, most likely because much of its stock has already been designated to allow mixed-use office and commercial development. On the other extreme, almost half of all industrial land in San Francisco is susceptible to conversion due to widespread introduction of mixed-use zones throughout the city. In Alameda County, which has the highest share of industrial land in the region, a more moderate 14% of industrial land is susceptible to conversion (Figure 4).

Figure 4. *Industrial land susceptible to conversion in Alameda County*

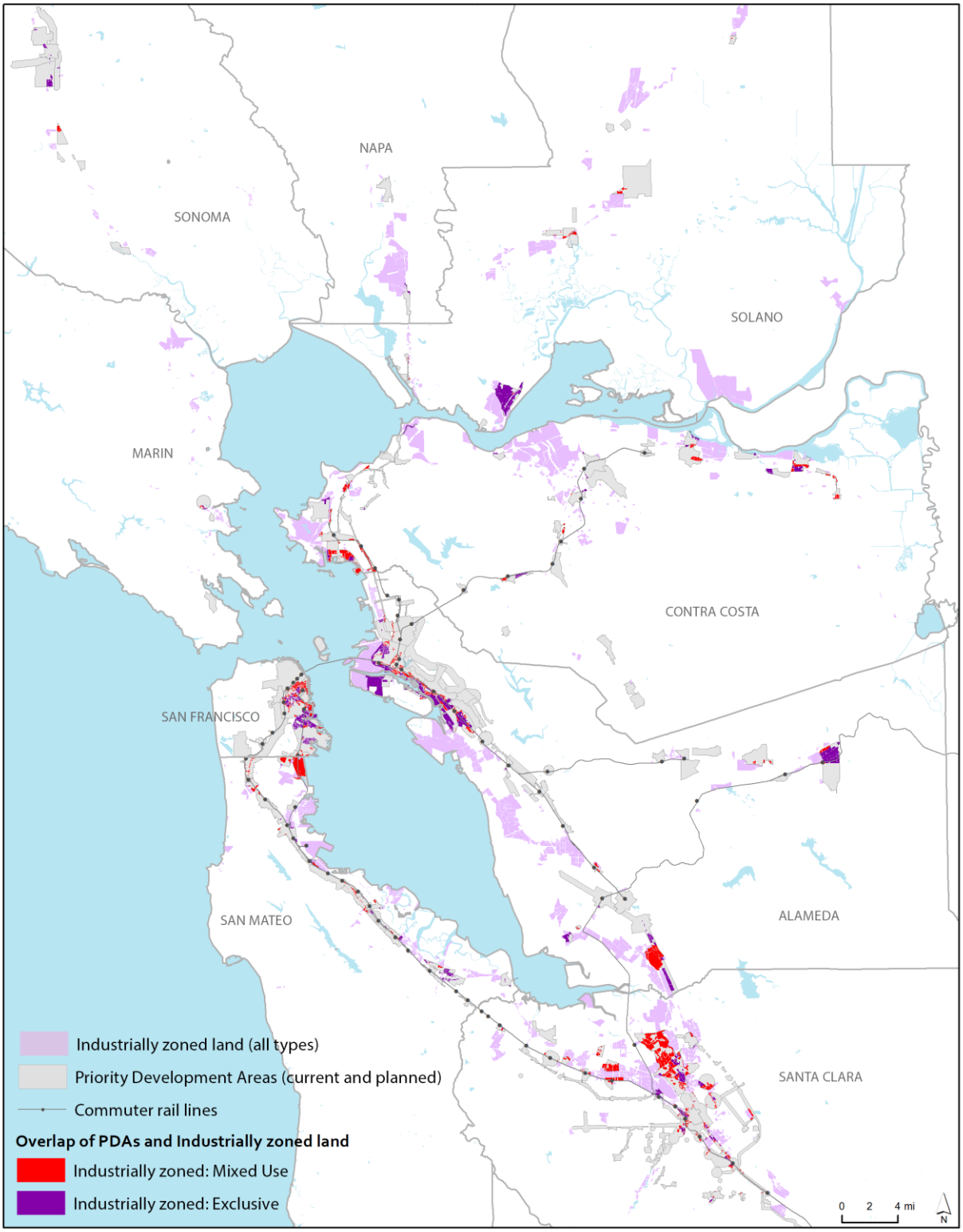


*Source: See Technical Memo #2: Understanding the Conversion of Industrially Zoned Land***.**

Across all nine counties, about 16,700 acres out of approximately 97,600 acres of industrially zoned land overlap with PDAs – about 17% (Figure 5). Nearly half of this overlap is exclusive industrial land, and half is mixed-use industrial land.

Based on this analysis, we estimate in the next section the amount of industrially zoned land available in the future, after accounting for land that is already converted and/or susceptible to conversion. Comparing the available land to the employment projections for 2040, we can evaluate whether there is sufficient land to meet future demand.

Figure 5. *Overlap of PDA designation and industrial land.*



CCI at UC Berkeley, 2016. Data source: MTC/ABAG and UC Berkeley

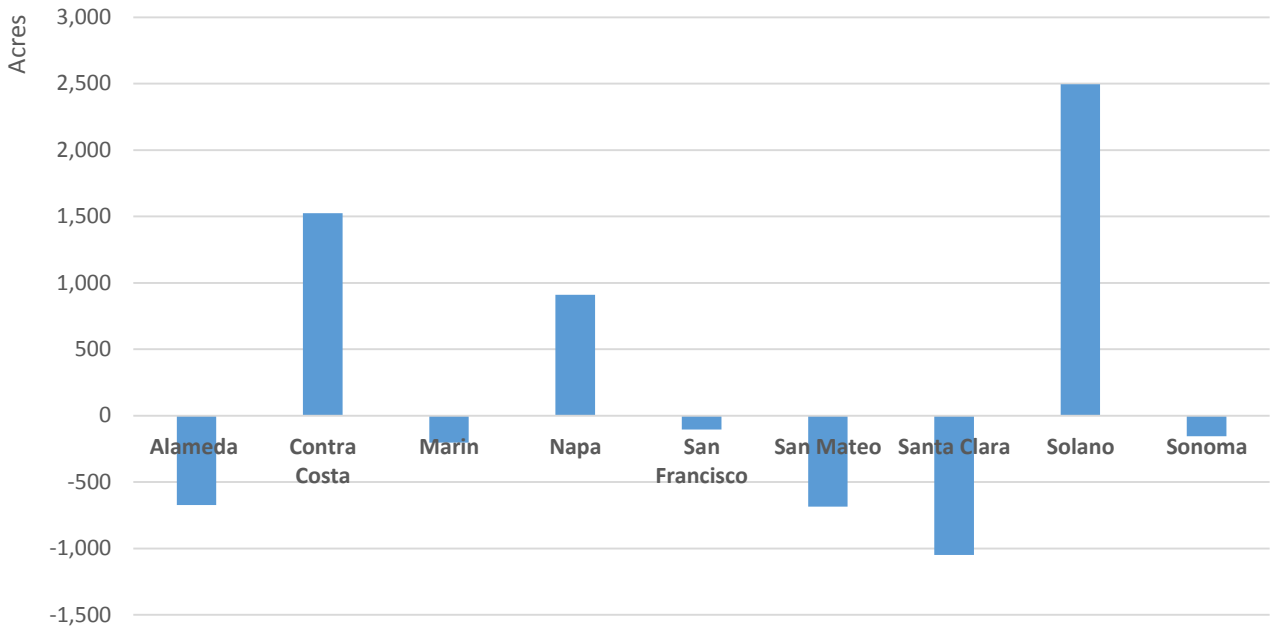
Source: See Technical Memo #2: Understanding the Conversion of Industrially Zoned Land.

IV. FUTURE DEMAND FOR AND SUPPLY OF INDUSTRIALLY ZONED LAND

Based on our definition of industrial land-dependent employment, the estimate for industrial jobs located on exclusive and mixed-use industrial land in 2011 for the Bay Area is 600,824 jobs (based on the NETS data).[1] Projecting out to 2040 – assuming existing patterns of distribution remain constant -- a 24% growth is expected, resulting in about 747,301 jobs. Zooming in from the county-level to the block group level, we anticipate that areas of growth will be found throughout the Bay Area. Although there are a few pockets throughout the region that show a net job loss, overall, there are no distinct areas of very concentrated decline.

With about 4,700 acres of industrial land needed to accommodate new growth between 2011 and 2040, the majority of counties – particularly Santa Clara, San Mateo, and Alameda – could experience a significant shortage of industrially zoned land, offset by considerable surpluses in Contra Costa, Napa, and Solano counties. Altogether, a surplus of 2,060 acres of industrially zoned land is anticipated in 2040, but much is located far from the greatest demand for industrial land, in the urban core (Figure 6).

Figure 6. *Projected industrial land surpluses and deficits by county, 2040.*



Source: See Technical Memo #2: Understanding the Conversion of Industrially Zoned Land.

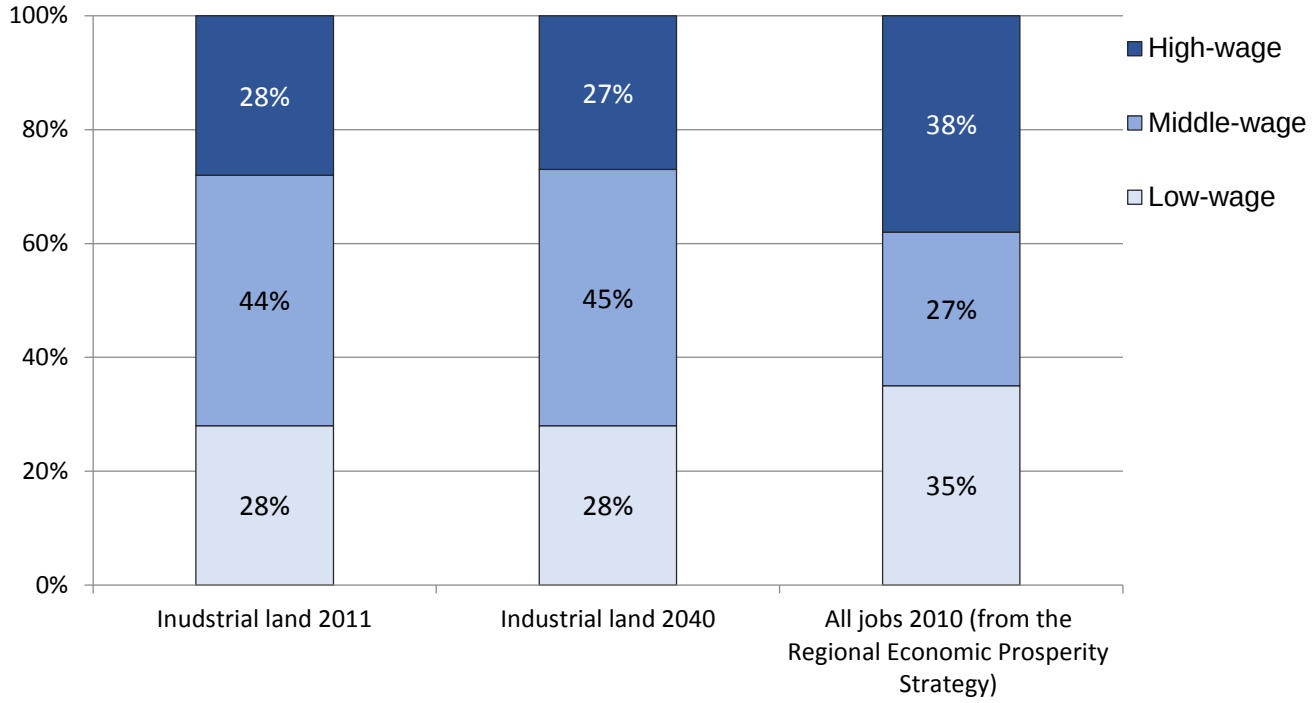
[1] 2011 was the most recent year for which NETS data was available when we began the study.

V. IMPACTS OF CHANGES IN INDUSTRIAL EMPLOYMENT ON JOB QUALITY

In 2011, middle-wage jobs counted for a near-majority (44%) of jobs on exclusive industrial land, while low-wage jobs counted for 28%, and high-wage jobs for 28% of jobs (Figure 7). This is a favorable distribution considering that only about a quarter (27%) of total jobs in the Bay Area offer middle wages, while a third (36%) offer low wages, and 38% offer high wages, according to the Regional Economic Prosperity Strategy (2014). In other words, middle-wage jobs are sixty percent more concentrated on industrial land as in the region generally.

If we apply employment growth rates for 2040 proportionately to the existing jobs estimated to be on industrial land, the distribution of low-, medium-, and high-wage employment remains surprisingly similar. The share of middle-wage jobs is projected to increase only slightly to 45%, at the expense of a one-percentage point decrease in the share of high-wage jobs. Furthermore, in 2040, the share of jobs that pay more than $18/hour and that require less than a bachelor's degree or five years' experience increases slightly from 57% to 60% of total industrial jobs.

Figure 7. *Wage distribution of jobs on industrial land in 2011 and 2040, compared to the wage distribution for all jobs in the Bay area in 2010*



Source: See Technical Memo #3: Assessing the impacts of changes in industrial employment on job quality and commuter patterns.

VI. WHAT DO BUSINESSES WANT? RESULTS OF BUSINESS VOICE SURVEY AND INTERVIEWS

To better understand why businesses want to locate on industrial land, as well as the challenges they experience, we conducted a survey and interviews of local businesses. Several themes emerged from these conversations.

One major theme was the lack of industrial space, the inability to find suitable expansion space, or the inappropriateness of available space for business needs. "*We need to be by major highway entrances. We need enough warehouse space to store pallets of refrigerated fruits and vegetables. We need dock space to back 48' trailers into. This is a challenge in an urban center, especially where PDR spaces are limited.*" (San Francisco business).

Businesses also reported concerns with the ineffectiveness of zoning to protect against encroachment by other uses. Market pressure from residential demand was a particular concern: "*Once an industrial property goes to residential, it will never produce even one good job. It is like building homes on fertile cropland--- you will never get another harvest*"(Oakland business owner), and: "*We need to preserve our city's PDR space. More and more residential and mixed-use facilities are encroaching on these areas*." (San Francisco business).

Some respondents championed zoning that permits concentrations of production-related businesses: "*We know that even with suburban office parks, these spaces can create community and energy*." (Fremont business), and: *"Due to the lower concentration of industrial businesses there is less synergy between companies in our area, higher transportation costs, and shortage of workers."* (West Berkeley business).

A further theme is the importance of retaining industrial land in order to facilitate goods movement: "*Ports-related waterborne commerce and rail-borne commerce, and related industrial companies, need to be kept in place in order to keep product prices low and minimize truck trips on the freeways.*" (Peninsula business).

Businesses mentioned many other infrastructure needs, from electrical supply in Berkeley, to traffic congestion in San Leandro, to storm water infrastructure in Fremont.

Above all, businesses spoke of the need to deal with land use conflicts, through buffer zones, exclusive zoning, or more effective mixed-use zones: "*We are in an industrial zone, but all around this zone are residences that built up after we were here, and this poses problems for noise and light in the area*," (Oakland business), and: "We have industrial uses adjacent to our complex, and we have parkland. There have been lots of fights between the parkland users and the industrial users. The commercial users didn't feel impacted and supported the industrial uses continuing where they are." (Petaluma business).

Special advantages and complications came with mixed-use locations: "The opportunity to work, reach suppliers and materials and live where we work is unmatched." (Vallejo business). "We need a MIX of truck access, large production space AND office/R&D in ONE location. Zoning rules and development trends mean it is becoming very hard to operate a small high tech manufacturing and R&D company like ours in the Bay Area which also depends on proximity to retail, transit, restaurants, food markets and other amenities in order to attract and retain highly educated and talented staff." (Berkeley business). "Incursion of residential to our

mixed-use area discourages trucking, which we rely on for our business. The big opportunity is that our location puts us centrally located to our prime market area." (Oakland business). "It's good that we have the downtown and the BART coming up, but how is the cost, developers going to play out. My neighbor is moving out this month because the landlord raised the rent fifty percent, the next move may be to Nevada, because the market pressure is coming up, and he is a solar innovator." (Fremont business)

VII. POTENTIAL CONSIDERATIONS FOR THE RETENTION AND CONVERSION OF INDUSTRIAL LAND

Overall, this analysis suggests that the conversion of industrial land is proceeding at a slow pace, but is likely to accelerate in coming years due to the visions put forward in general plan and PDA designations. Several considerations can guide city decision-making about where to retain industrial land and where to convert it. Below are potential characteristics in terms of transportation, economy, equity, zoning, environment, and location that could enter into the decision. These may contribute to the process of designating Priority Production Areas in the future.

Table 2. *Suggested characteristics for industrial land retention and conversion.*

	Retain as industrial	**Convert to residential or mixed-use**
Transportation	Proximity to freight and/or port facilities	Proximity to transit
Economy	Production or related employment	High-density non-production employment
	Proximity to business clusters/suppliers/markets	Proximity to markets/customers
	Critical supplier to local businesses	Limited linkages to local economy
	Industry stable or growing	Industry in decline
Equity	Offers middle-wage jobs for less-skilled workers	Potential for affordable housing
Land use/zoning compatibility	Surrounded by medium/heavy industrial zoning	Adjacent to residential
Environment	Brownfield site, remediation infeasible	Environmental health hazard for surrounding communities (especially if historically disadvantaged)
Adequacy of supply	In areas with projected deficit of industrial land	In areas with projected surplus of industrial land
	Low vacancy rates for industrial buildings	High vacancy rates for industrial buildings

Other characteristics may warrant further consideration. For instance, projected sea level rise may interplay with decisions regarding industrial, residential or mixed-use development. Additionally, different characteristics may be appropriate depending on location, type of industry, and special concerns such as when designating buffer zones.