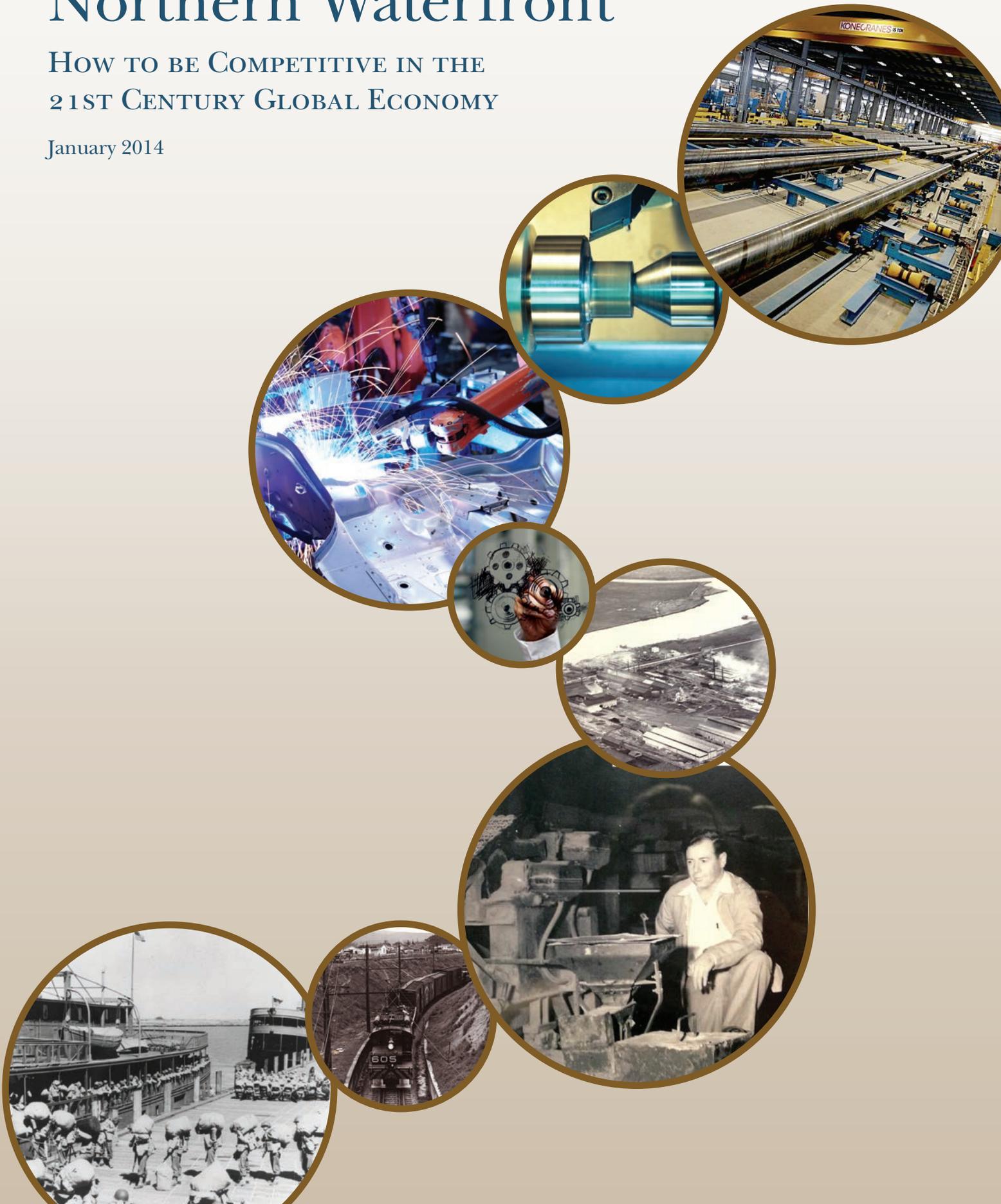


# Revitalizing Contra Costa's Northern Waterfront

HOW TO BE COMPETITIVE IN THE  
21ST CENTURY GLOBAL ECONOMY

January 2014







“It’s long been a vision of mine to revitalize Contra Costa County’s Northern Waterfront. As a young man, working first at USS-POSCO and then at Dow Chemical, I gained a deep appreciation and understanding of how important Pittsburg’s working waterfront is to the community. Likewise, I see the revitalization of the County’s Northern Waterfront as vital to anyone concerned with economic development in Contra Costa County.”

“I want to bring together all the stakeholders on the County’s Northern Waterfront, from Hercules to Oakley. That includes private industries, the waterfront cities, public agencies, and community groups. I believe if we act as a regional group, we can wield more influence than if each of us tried to act alone. The Northern Waterfront is one of the County’s greatest economic assets, but underutilized. I want to change that.”

–Supervisor Federal Glover,  
District V Contra Costa County Board of Supervisors

April 2013



# Revitalizing Contra Costa's Northern Waterfront

## How to be Competitive in the 21st Century Global Economy

Project Commissioned by the Contra Costa County Board of Supervisors under the direction of the  
Contra Costa County Conservation and Development Department

### ACKNOWLEDGEMENTS

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# Executive Summary

## Background

**C**ONTRA COSTA COUNTY'S NORTHERN WATERFRONT, a 55-mile stretch of shoreline extending from Hercules to Oakley, is an important economic asset to the local economy given its waterfront setting with deep-water channels, marine terminals, proximity to two Class 1 railroad lines, critical mass of manufacturing companies, electric generating capacity, industrial zoned land, skilled workforce, and proximity to growing markets in the Bay Area and Northern California. Regional goods movement infrastructure also provides access to U.S. and foreign markets. Although these assets support an active manufacturing base, employment has declined over the past several decades. Given the region's comparative advantages and emerging global economic trends, policy-makers see the potential to revitalize the industrial areas along the Northern Waterfront.

In early 2013, at the urging Supervisor Federal Glover, District 5, the County Board of Supervisors launched an initiative, with active participation by the cities of Hercules, Martinez, Concord, Pittsburg, Antioch, and Oakley, to engage stakeholders along the Northern Waterfront, including representatives from private industry, in a dialogue about the economic prospects for the area.

The consultant team of Craft Consulting Group and Cambridge Systematics, Inc. was commissioned to conduct a market assessment to better understand the economic development opportunities of the area from a real estate, transportation infrastructure, and economic perspective; examine how global and domestic trends might impact the Northern Waterfront; and assess the likelihood of attracting manufacturing companies to the Northern Waterfront, particularly in growth-oriented and emerging industries. This report evaluates both the opportunities and challenges facing the Northern Waterfront and provides a framework with recommended actions to help revitalize and transform the Northern Waterfront into a 21st century economic asset.

## Economic Significance of Manufacturing Sector

The Northern Waterfront plays an important role in the local economy, employing more than 26,000 workers spread across all employment sectors (of which 28% are in manufacturing jobs) and generating \$21.6 billion in economic output. **In 2012, the manufacturing sector along the Northern Waterfront accounted for more than 7,300 jobs and \$9.3 billion (13.9%) of the County's overall Gross Regional Product (GRP) of \$67 billion.** Given its economic assets, the Northern Waterfront has developed a comparative advantage as an industrial location with a concentration of manufacturing employment 2.2 times greater than the national average.

## Historical Role of Northern Waterfront

Historically, the Northern Waterfront provided access to water transportation for shipping, inexpensive land, and cheap labor. Communities along the Northern Waterfront were able to capitalize on these assets attracting large resource intensive manufacturing

plants that produced explosives, chemicals, refined petroleum products, sugar, cement, lumber, silver, lead, and steel. Resource-based industries dominated the Northern Waterfront's manufacturing sector during the early part of the 20th century with the processing of agriculture products, crude oil, metal ores, and other natural resources. Industrial development came early beginning in the late 1800's. With its wide-open land area, waterfront access, and railroads, the Northern Waterfront was an attractive location for the new large scale manufacturing facilities of that time. Companies such as Redwood Manufacturing, Selby Smelting & Lead, Union Oil, Mountain Copper, Hercules Powder Works, California Fruit Packers Association, C&H Sugar, and Columbia Steel built manufacturing plants along the shoreline. While the companies may have changed due to various business and economic reasons, many of these same industries are still operating today along the Northern Waterfront.

## Growth/Decline of Manufacturing Sector

Manufacturing employment in Contra Costa County and the Northern Waterfront grew from a small base in the early 1900's to become the dominated employment sector by mid-century. In 1962 almost 40% of the County's workforce was employed in manufacturing. Today less than 7% of the workforce is employed in the manufacturing sector. The Northern Waterfront has followed a similar pattern, as the county's manufacturing sector matured and the economy has transitioned from predominately manufacturing to increasingly more service sector employment. Over the past decade manufacturing employment in the Northern Waterfront declined by 21.5%, most of which occurred since the start of the Great Recession in late 2007.

During this same time period, the number of manufacturing firms also declined. Between 2001 and 2011 approximately 45 establishments closed their doors or moved out, almost all were small businesses with less than 50 employees. Today, the Northern Waterfront

includes approximately 180 manufacturing firms spread across various manufacturing subsectors. A survey of manufacturing firms in the Northern Waterfront during the third quarter of 2013 found that 44.8% of the manufacturers had plans to grow their business over the next three to five years by expanding into new markets, adding equipment, or hiring new employees.

The overall outlook for the manufacturing sector in the Northern Waterfront remains uncertain. Projections of historical trends indicate that the total number of manufacturing jobs will continue to decline over both the short and long-term. This scenario reflects "business as usual" where nothing will change as the global economy emerges from the recession with modest economic growth and productivity gains limiting the need for expansion of the manufacturing workforce. While this is a likely outcome, there are emerging global and national trends including the growth of advanced manufacturing firms, that if properly supported could lead to the reversal of the historical trends and the expansion of manufacturing employment in the Northern Waterfront.

## Building on Competitive Strengths

Today, the industrial areas along the Northern Waterfront include a combination of traditional and new industries such as oil refineries, petro-chemical plants, metal fabrication, sugar processing, and life science firms. These existing industries represent the core from which to build a more vibrant and diversified regional economy that continues to innovate and attract new emerging industries to the Northern Waterfront including clean technology, alternative energy, recycled materials processing, food & beverage companies, green building products, precision instruments, machinery, and transportation equipment.

By building on its competitive strengths the Northern Waterfront would benefit from the expansion of several industry clusters including:

1. Clusters anchored by global companies with products being produced for local and regional markets (such as chemical products, pharmaceuticals, and transportation parts and equipment). Research and innovation is taking place elsewhere, but products are being produced locally for domestic and global markets;
2. Clusters dominated by regional companies in industries (such as food & beverage, fabricated metals, and printing) producing products where time to market is important, high shipping costs, or proximity to customers dictate the need for local production facilities;
3. Clusters producing products which are energy and resource intensive that could utilize the electric power generation capacity or maritime facilities located along the Northern Waterfront (this would include primary metals, refined petroleum products, and nonmetallic mineral based construction materials);
4. Clusters consisting of emerging industries with innovative new products (in clean technology, recycled materials, alternative energy, and water technologies) being developed by Bay Area firms that would benefit by having their initial production activities located in close proximity to their research and product development headquarters.

## Responding to the Changing Economic Landscape

Despite its strengths, the Northern Waterfront has suffered from a changing economic landscape and a lack of investment in facilities and infrastructure. Impediments to business expansion and attraction exist including competition from neighboring regions, the brownfield character of some industrial parcels, and congested roads and highways that connect the Northern Waterfront to the Interstate system.

Most of the industrial real estate is older and borders on functional obsolescence or was built for 20th century manufacturing operations that required large footprint buildings. Today's advanced manufacturing firms are smaller and more efficient in their utilization of modern spaces. Conventional large-scale vertically integrated manufacturing operations are less common as companies seek to minimize costs and provide flexible manufacturing systems and platforms for responding to changing customer demands, technologies, and economics.

Although the area has attracted new businesses and investment, along with the upgrading of older facilities, it still struggles to make a successful transition from an economy based primarily on traditional manufacturing with large scale, resource-based processing industries to one based on advanced manufacturing, innovation, and emerging technologies.

Overcoming decades of neglect will require economic development strategies that are sustained over the long-term. Business attraction, expansion and retention efforts will involve more than just the availability of suitable industrial zoned land, low cost real estate, or the fast-tracking of building permits and project approvals. In order to remain competitive with other regions and manufacturing centers local governments must address a number of challenges including investing in goods movement infrastructure, preparing a pipeline of workers with advanced manufacturing skills, preserving and protecting existing industrial zoned lands, structuring a portfolio of financial and tax incentives, building advanced telecommunications infrastructure, fostering the growth of targeted industry clusters, and actively marketing the Northern Waterfront as a desirable location for advanced manufacturing firms and emerging industries.

Working collaboratively, local governments can help tilt site selection decisions by manufacturing firms in favor of the Northern Waterfront by focusing on providing reliable infrastructure, a skilled workforce, and a business friendly climate that supports industrial development. Financial incentives may be important

in the final determination, but they cannot turn a poor location into a good site. Companies are realizing that financial incentives cannot make up for high labor costs, poor highway access, a lack of skilled labor, or high energy and occupancy costs.

## Emerging Opportunities

The convergence of various global trends, market forces, new technologies, and public policies presents a unique opportunity for the Northern Waterfront to expand and diversify its industrial base.

Rising labor rates in China and other countries, along with increased productivity by American workers have reduced the labor cost advantage in other countries to a point where manufacturing in the U.S. is becoming more competitive, especially for high value-added, capital intensive industries. In addition, rising energy prices have made global transportation and overseas manufacturing more expensive for products sold in the U.S. At the same time, the recent boom in U.S. oil and gas production has increased the demand for machinery and chemicals to extract the oil and gas while providing U.S. manufacturers with an inexpensive reliable energy supply. Studies by Boston Consulting Group, PriceWaterhouseCoopers, McKenzie & Company, and others suggest that these trends may be the beginning of long-term structural changes supporting a U.S. manufacturing resurgence and reshoring.

New business models, processes, and technologies allow for flexible, customized production of specialty products that are competitive with the mass production of commodity products. New technologies (including robotics, 3D printing, computer aided modeling, and computer numerical controlled machines) and business models (such as lean manufacturing, global footprint design, and flexible manufacturing systems) will make manufacturing in the U.S. more competitive.

The emergence of new industries in clean technology, energy efficiency, alternative energy, and other sectors present opportunities to capture manufacturing firms in the early-stage when they are producing for regional markets and need to be located in proximity to their research and product development headquarters.

Industrial development, especially heavy industry, has fewer options when locating or expanding new facilities. A limited supply of industrial zoned land apportioned in large parcels with rail and water access exists in the Bay Area. Various studies have documented the loss of industrial lands creating an opportunity for preserving and modernizing industrial real estate along the Northern Waterfront for industries that are expanding or relocating.

Seizing these emerging opportunities and addressing development constraints faced by the Northern Waterfront will make the region a more competitive location and lead to a stronger more productive manufacturing sector. Accomplishing this objective will not happen overnight. A successful outcome resulting in job growth and business expansion will require a sustained long-term commitment by local governments acting together in a collective manner.

## Development Alternatives

A range of development alternatives and growth assumptions prepared by the consultant team, based on market trends and possible public policy actions, indicate the potential for new job growth over both the short and long terms. Mid-range employment projections show annual employment growth of 100 to 250 jobs with a cumulative total of 1,974 to 4,678 net new manufacturing jobs being created in the Northern Waterfront over the next 20 years with the support of local government policies and investment. The projected job growth could translate into demand for approximately 2 – 5 million square feet of additional industrial space.

Due to the multiplier effect manufacturing job growth would add another 11,000 to 28,000 jobs to the regional economy as a result of local spending for supplies, energy, repairs, new facilities, equipment, and professional services from a broad array of industries including engineering firms, wholesale trade, warehouse/distribution, transportation, and construction sectors required to support the production process.

## Target Industries

Given the emerging trends and an existing base of core companies, the Northern Waterfront has an opportunity to attract companies in emerging new industries and advanced manufacturing. A critical mass of existing companies form the basis for several industry clusters, which include transportation fuels, diversified manufacturing, clean technology, food and beverage processing, and life sciences. Properly supported, these industry clusters could increase the productivity and job creation of existing companies and attract new industries and related businesses.

## Intraregional Coordination of Economic Development Programs and Support Services

Local jurisdictions should collaborate to avoid competition among communities within the Northern Waterfront. Various degrees of intraregional coordination are possible ranging from the establishment of a formal organization to undertake economic development planning, financing, business recruitment, and retention activities to informal coordination that entails jurisdictions within the region talking to each other on a regular or ad-hoc basis as needed for specific issues. Intraregional coordination also could involve the pooling of resources to attract companies to the region and the investment in regional infrastructure. The motivating factor for collaboration is the recognition that job creation, business attraction, and regional infrastructure investment have economic benefits that spill over city boundaries.

## Public Policy Initiatives

Local policy-makers have a role to play in positioning the Northern Waterfront as a competitive location for manufacturing jobs. Public policy recommendations to enhance the Northern Waterfront's competitive advantages have been organized around the following seven categories:

1. **Business Climate and Regulatory Environment** - Improving and simplifying the regulatory process to improve outcome certainty, identifying high-priority development areas, and protecting industrial zoned land from conversion to non-industrial uses;
2. **Infrastructure Investment** - in water supply, sewers, roads, and advanced communications are critical components of the development capacity and long-term competitiveness of the Northern Waterfront. Businesses rely on infrastructure to conduct their work and transport their goods and services;
3. **Development Incentives and Financing** - for infrastructure and business expansion should be investigated and a package of financing programs and investment incentives developed that is tailored to the needs of the Northern Waterfront such as sales tax exemptions, hiring credits, industrial development bonds, SBA loans, PG&E rebates and rate reduction programs, and the Recycling Market Development Zone Loan Program;
4. **Regional Branding and Marketing** - to promote the competitive advantage of the Northern Waterfront as a location for advanced manufacturing and targeted industry clusters;
5. **Cluster Development, Innovation, and Productivity** - to support the growth of targeted industry clusters through increased business connectivity, industry interaction, adoption of innovative technologies and processes, and buy local programs;
6. **Business Development and Support Services** - that are coordinated and targeted to startups, and small and medium sized manufacturing businesses in the Northern Waterfront;
7. **Workforce Development** - focused on preparing a skilled workforce in advanced manufacturing that meets industry's needs.

## Conclusions

The outlook for industrial development along the Northern Waterfront, although uncertain, is favorable assuming that local governments act in a collaborative manner and take the necessary actions to capitalize on the emerging trends and overcome the challenges faced by the region. Local governments and stakeholders should work together to create a new framework for regional cooperation with a clear focus and objective of enhancing the Northern Waterfront as a competitive location for industrial development.

By adopting a regional economic development strategy, the Northern Waterfront has the potential to become a more attractive location, capable of capturing its share of the Bay Area's projected growth in manufacturing employment.

The window of opportunity will not remain open forever and competition from other regions is strong. The time for action is now. **By acting collectively, decisively, and strategically, local policy-makers have a unique opportunity to develop the Northern Waterfront into a 21st century economic asset.**

# Introduction

**C**ONTRA COSTA COUNTY'S NORTHERN WATERFRONT is an important economic asset to the local economy given its waterfront setting with deep-water channels, marine terminals, proximity to two Class 1 railroad lines, critical mass of manufacturing companies, electric generating capacity, industrial zoned land, skilled workforce, and proximity to growing markets in the Bay Area and Northern California. Regional goods movement infrastructure also provides access to domestic and foreign markets.

## Regional Context

The Northern Waterfront has a long history as a maritime shipping and industrial center. With a front door onto San Pablo Bay, the Northern Waterfront runs along the County's northern shoreline through the Carquinez Straits and Suisun Bay to the confluence of the Sacramento-San Joaquin Rivers from Hercules on the west to Oakley on the east. The Northern Waterfront (see Figure 1) extends 55 miles along the shoreline and encompasses a wide range of land uses from industrial, commercial, residential, public, and recreational uses, to marinas, wharfs, natural habitat, open space, and wildlife refuges. It is where the Bay Trail ends and where the California Delta Trail begins, where salt water from the Bay and freshwater from the Delta meet. Parks and open space account for 60% of the land use and industrial lands make-up approximately 20% of the Northern Waterfront's 63.86 square miles. The cities of Hercules, Martinez, Pittsburg, Antioch, Oakley, and north Concord line the shores of the Northern Waterfront, as do the small unincorporated communities of Rodeo, Crockett, Port Costa, and Bay Point. The U.S. Army maintains and operates a large military marine terminal in the Northern Waterfront with rail lines, piers, transfer facilities, and staging areas.

## Economic Significance

The Northern Waterfront plays an important role in the local economy, employing more than 26,000 workers (of which 28% are in manufacturing jobs) spread across all employment sectors and generating \$21.6



**Figure 1: Northern Waterfront Study Area**

billion in economic output. The northern shoreline is highly industrialized, while the County's interior is predominately residential, commercial and light industrial in character. Manufacturing is the largest employment sector, generating jobs for more than 7,325 workers with average wages well above the County's median household income. **In 2012, the manufacturing sector along the Northern Waterfront accounted for 13.9% or \$9.3 billion of the County's overall Gross Regional Product (GRP) of \$67 billion.** Manufacturing employment is heavily concentrated along the Northern Waterfront, 2.2 times greater than the national average. While industrial property constitutes a small percentage of the total taxable parcels, its assessed value makes-

## C<sup>and</sup>H Sugars

Refinery at Crockett, California  
Largest in the world



up a significant portion of the local tax base. Annual capital spending on maintenance and upgrades provides on-going construction jobs. Local spending due to operating expenditures generates additional demand for goods and services in the local economy, thereby creating employment in other sectors, including professional services, utilities, transportation and warehousing, financial services, and wholesale and retail trade. For every job created in the manufacturing sector, more than six indirect jobs are created in the local economy.

### Need For Intervention

Like many older industrial areas the Northern Waterfront has seen better days. Over the past several decades the Northern Waterfront has experienced declining employment, benign neglect, and a lack of investment in facilities and infrastructure. Action by local government is required for revitalization of the Northern Waterfront in order to restore the area to its former vitality as a leading center for industrial and maritime-related development.

### Northern Waterfront Initiative

In early 2013, the County Board of Supervisors launched an initiative to engage stakeholders along the Northern Waterfront, from both the private and public sectors, who are concerned about its economic future; wherein, the stakeholders could share information and exchange ideas about the emerging trends and issues affecting the Waterfront with a specific focus on how maritime and landside transportation influences the Waterfront's current and future economic prospects.

Six cities (Hercules, Martinez, Concord, Pittsburg, Antioch, and Oakley) within the study area are actively participating with Contra Costa County to develop a strategy for revitalization of the Northern Waterfront. The primary objective of the Initiative is to promote economic development in the region, thereby strengthening the economic vitality of the communities along the shoreline.

The consultant team of Craft Consulting Group and Cambridge Systematics, Inc. were commissioned by the County Board of Supervisors to conduct a market assessment to better understand the area from a real

estate, transportation infrastructure, and economic perspective; and assess the likelihood of attracting companies to the Northern Waterfront, particularly in emerging and growth-oriented industries. An analysis of the Northern Waterfront's strengths, weaknesses, opportunities, and threats (SWOT) was conducted (see Appendix Table A2: Competitive Assessment) along with other evaluations which enabled the consultant team to present a picture of the existing business climate and goods movement system in the area and highlight the positive attributes which should be exploited and the development constraints that need to be addressed. Consideration was also given to how emerging global and domestic trends might impact industrial development in the Northern Waterfront and are further discussed in this report.

An Atlas showing existing conditions along the Northern Waterfront has been prepared by Contra Costa County's GIS staff with input from the consultant team illustrating various factors influencing industrial development of the area. An employer survey was conducted by Jim Cassio & Associates of 154 manufacturing and goods movement firms located in the Northern Waterfront between August 27, 2013 and October 2, 2013 to gain a better understanding of industry's needs along with current issues and emerging trends. A total of 69 firms completed the survey for a 45% response rate. Four background reports (Memorandums #1-4) covering market conditions were prepared including 1) an economic overview and profile of industrial and maritime-related development in the Bay Area and Northern Waterfront, 2) inventory

*Hercules waterfront prior to redevelopment in the 1990s.*



and analysis of existing industrial space in the Bay Area and Northern Waterfront, 3) market opportunities and constraints influencing industrial development in the Northern Waterfront, and 4) the future development outlook for the Northern Waterfront. A reconnaissance survey of transportation infrastructure and operational issues was conducted by Cambridge Systematics on September 4, 2013 as part of Memorandum #1 to identify key transportation issues affecting the Northern Waterfront. The Technical Memorandums, together with the employer survey and Atlas, provide the background information for the market assessment of industrial development opportunities along the Northern Waterfront. This report evaluates existing market conditions and describes emerging opportunities, target industries, and projected employment growth scenarios along with recommended actions that policy-makers in the region can consider for implementation in order to revitalize and transform the Northern Waterfront into a 21st century economic asset. The study findings and recommendations contained herein are intended to serve as a roadmap to accomplish this goal.

# The Northern Waterfront's Historical Role

**H**ISTORICALLY, the Northern Waterfront has attracted major industrial users due to its proximity to strategic waterways that provided easy access for marine transportation. Industrial development came early to Contra Costa County, appearing along the waterfront beginning around the 1860s.<sup>1</sup> Coal was discovered in 1859 in the hills south of Antioch. Several years later, copper ore was discovered near Antioch and smelting works were built. Deep-water access allowed for the shipping of various commodities including grain and other agricultural products. Port Costa became a major grain port with merchant sailing ships, warehouses, and waterfront wharves. Antioch and Pittsburg also were important shipping points for grain (wheat and barley). Industry increasingly began moving to Contra Costa's northern shoreline in the late 1800s initially attracting gunpowder manufacturers and glue factories. Over the next hundred years, communities along the Northern Waterfront saw the growth of canneries, paper mills, chemical plants, fiberboard factories, steel mills, and oil refineries.

By the early 1900s, some forty factories had opened along the Sacramento River, including C&H Sugar, Standard Oil of California, Union Oil, Redwood Manufacturers Company, and Hercules Powder Works. The first manufacturers to come to Contra Costa County were gunpowder and dynamite works serving the mining industry. Chemical plants entered the picture at the turn of the 20th century, as demand for sulfuric acid, chlorine and ammonia fertilizers increased with advances in chemistry and industrial agriculture. Oil refineries were built along the waterfront beginning with Union Oil in 1896; Standard Oil followed in 1901, and four others came in soon thereafter, making Contra Costa one of the leading refining centers in the U.S. Crude oil for refining was transported by pipeline,

<sup>1</sup> Walker, Richard A. "Industry Builds Out the City: The Suburbanization of Manufacturing in the San Francisco Bay Area, 1850-1940", 2004



*The U.S. Steel mill at Pittsburg was a huge complex in the 1940s. The Sacramento Northern railroad reached the mill through town over city streets*

ship, and rail tank cars from the San Joaquin Valley and Ventura fields. Other major industries included food processing and steel.

By 1920, the Northern Waterfront accounted for over half the shipping tonnage on San Francisco Bay. By 1940, Contra Costa was the largest manufacturing center in California in terms of the value of its industrial output. During World War II the Concord Naval Weapons Station was a major munitions ship loading facility. Following the war, other industrial plants were built. DuPont for example, built and operated a petrochemical manufacturing plant near Oakley for more than forty years, from 1956 to 1997.

The Northern Waterfront's location along the Carquinez Strait and Suisun Bay played an important role in its early industrial development. Waterfront locations historically have attracted manufacturing and processing industries that want to take advantage of low-cost inbound transportation of raw materials for production and outbound shipments of finished products to both international and domestic markets.

Transport of bulk cargo required that manufacturing be done near the port in order to reduce transportation costs. This resulted in the building of large-scale industrial facilities and warehouses with port facilities handling the intermodal transfer of cargo between ships, barges, trucks, and railroads. Ports became the hub around which the maritime sector operated, serving as gateways between the hinterlands and overseas markets to which they were linked by commerce. The Northern Waterfront has followed this historical development pattern.

Today, the industries located along the northern shoreline - oil refineries, petro-chemical manufacturing, steel fabrication, food processing, recycling facilities, wastewater treatment plants, biotechnology firms, and electric power generating facilities – represent a critical strength and the core from which to build a more vibrant regional economy that is positioned to attract innovative and emerging industries such as advanced manufacturing, clean technology, alternative energy, recycled materials, food processing, green building products, electronic components, precision instruments, machinery, and transportation equipment companies along with their supplier networks looking to relocate or expand.

Indifference and benign neglect has led to declining investment in infrastructure and facilities over the past several decades, which has reduced the Northern Waterfront's ability to remain competitive as a working waterfront. The physical development of the area, which began over 100 years ago, was based on a different platform for manufacturing and goods distribution, one that was well suited to the infrastructure and building types of the time. Today, the question faced by local governments is how best to adapt this older industrial area to meet the needs of modern advanced manufacturing firms.



# Existing Industrial Base

## Industrial Sector

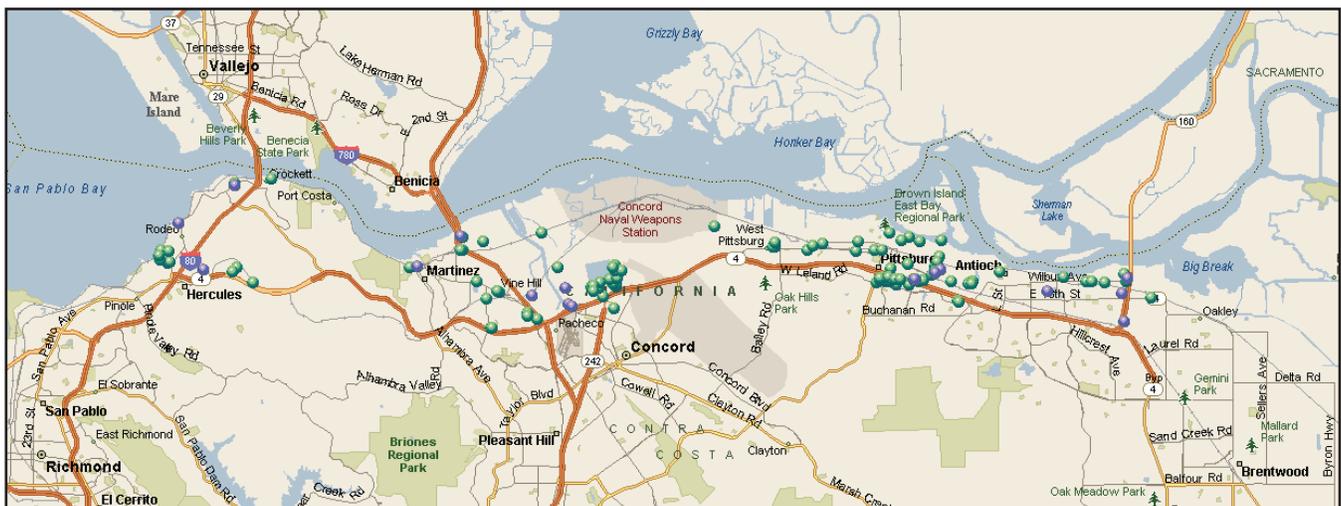
**T**HE MANUFACTURING SECTOR along the Northern Waterfront includes a variety of firms divided into a number of subsectors based on the type of products, material inputs, and production processes. The North American Industry Classification System (NAICS) groups manufacturing establishments according to their primary activity and the similarity in their production processes. For purposes of this study the manufacturing sector has been divided into 23 subsectors based on their 3-digit (or 4-digit) NAICS code. When firms in the same industry locate near each other they gain a number of advantages that makes them more productive. Manufacturers can also benefit from locating in a geographic area that has a diverse set of industries. Figure 2 shows the distribution of manufacturing, distribution, and logistics firms in the Northern Waterfront. The Northern Waterfront's traditional manufacturing base has been concentrated in large-scale heavy industries (petroleum refining, chemicals, steel, sugar processing, and electric power generation).

## Structure/Composition of Manufacturing Sector

The Northern Waterfront has a diversified base of manufacturing firms spread across 21 subsectors (two subsectors do not include any firms). The largest subsectors in terms of employment include petroleum refining, chemicals, pharmaceuticals/drugs, medical equipment and supplies, primary metals, fabricated metal products, computer and electronic products, electrical equipment, food processing, machinery, printing, and nonmetallic mineral products. Although there are a wide range of industries represented in the Northern Waterfront, the manufacturing sector is highly specialized in petro-chemicals with several of the State's largest refineries located in the area. Six manufacturing subsectors account for 81.2% of all manufacturing employment in the Northern Waterfront.

The manufacturing sector is made up of a few large companies and a large number of small and medium sized firms. There are approximately 189 manufacturing firms and another 50 firms in the goods movement sector (wholesale trade, transportation and warehousing) according to U.S. Census Bureau County

**Figure 2: Industrial Activity Centers along the Northern Waterfront**



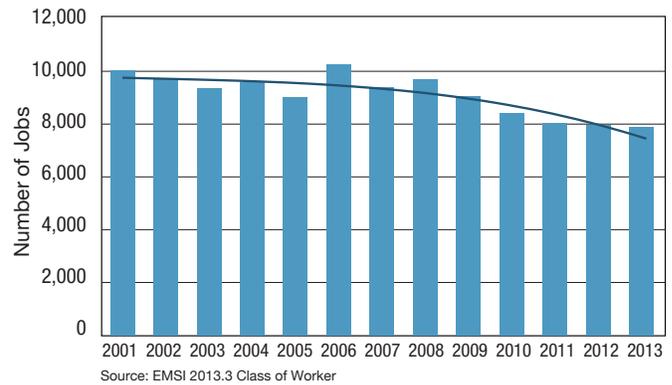
Business Patterns data. Small firms having fewer than 50 employees account for approximately 82% of the manufacturing firms. Large manufacturing firms are prominent in mature subsectors such as petroleum refining, chemicals processing, and steel fabrication; while small and medium sized firms are spread across all subsectors. Small and medium-sized manufacturers (SMEs) typically do little R&D and generally lag in productivity. These SMEs would benefit the most from productivity improvement services and advanced manufacturing technologies and processes.

The number of manufacturing firms in the Northern Waterfront has declined over the past several decades, as has the overall number of manufacturing jobs. Between 2001 and 2011 approximately 45 manufacturing firms closed their doors or moved out of the area according to Census Bureau data. Most of these firms were small businesses with less than 50 employees. The surviving companies have become more competitive, increasing their output with fewer workers. Although new industries such as biotechnology and clean technology emerged during the past several decades over many parts of the Bay Area, only a few companies in these industries have located in the Northern Waterfront study area. Growth and expansion of established firms has provided the bulk of any new job creation.

## Major Employers

Major employers in the Northern Waterfront's manufacturing sector include a number of globally competitive companies such as Shell, Phillips 66, Tesoro, Dow Chemical, USS POSCO, Bio-Rad, and C&H Sugar. Major manufacturing employers in the Northern Waterfront are shown in **Table 1**. While many of the largest industrial firms are located in owner-occupied facilities, industrial and business parks in the Northern Waterfront also house major employers such as Bio-Rad Laboratories and Pacific BioLabs.

**Figure 3: Manufacturing Sector Employment Growth Trends in the Northern Waterfront 2001-2013**



## Growth of the Manufacturing Sector

Manufacturing employment in the Northern Waterfront grew from a small base in the early 1900's to become one of the dominated employment sectors by the mid-1900s. Today approximately 9.5% of the private sector jobs are in manufacturing. Since 2001, manufacturing employment in the Northern Waterfront has declined by 21.5%, most of which occurred in the post-recession period since 2008 (see **Figure 3**). The decline in manufacturing employment, both in the absolute level of employment and as a share of total employment, in part reflects the structural shift in the U.S. economy and other advanced industrialized countries to service sector jobs and away from production jobs as the manufacturing sector has increased productivity, outsourced non-production jobs, or moved manufacturing plants off-shore.

By comparison, U.S. manufacturing output has steadily declined from 27% of GDP in 1950 to 23% in 1970 to 14% in 2000 to 11.9% in 2012. U.S. manufacturing employment, which represented 22% of all nonfarm payrolls during its peak in June 1977, has fallen to less than 9% of total employment today, primarily due to increased productivity and the off-shoring of low-skilled, low wage jobs. Manufacturing as a share of GDP has also declined in Germany and Japan, however, both countries have retained relatively larger manufacturing sectors at 17% and 21%, respectively.

**TABLE 1: Major Manufacturing Employers in the Northern Waterfront**

Firms with 100-plus Employees	
Bio-Rad (includes several different divisions)	Life Sciences
C&H Sugar	Food & Beverage Processing
Dow Chemical	Chemicals
Fresenius USA	Life Sciences
Georgia-Pacific Corporation	Construction Materials
Golden Gate Petroleum Co.	Petroleum Refining
Henkel Corporation Aerospace Material Division	Polymers & Coatings
Nalco Energy Services	Energy
Phillips 66	Petroleum Refining
Ramar Foods International Corp	Food & Beverage Processing
Shell Martinez Refining Co.	Petroleum Refining
Telfer Oil Companies	Petroleum Refining
Tesoro	Petroleum Refining
USS Posco Industries	Metal Processing & Fabrication
Firms with 35-99 Employees	
Arista Business Imaging Solutions, Inc	Printing
Benchmark Electronics Precision Technologies Division	Electronic Components
Bishop-Wisecarver Corporation	Metal Processing & Fabrication
Cease Fire	Communication Equipment
Criterion Catalyst	Industrial, Agriculture & Household Chemicals
General Chemical	Industrial, Agriculture & Household Chemicals
Hasa, Inc	Industrial, Agriculture & Household Chemicals
K2 Pure Solutions	Water Purification/Filtration Equipment
Nordson MARCH	Life Sciences
Merit Ends Inc	Metal Processing & Fabrication
Pacific BioLabs	Life Sciences
Pg Emminger, Inc	Wood Products
Rhodia	Industrial, Agriculture & Household Chemicals
Silgan Containers Manufacturers Inc	Metal Processing & Fabrication
Verco Decking, Inc.	Metal Processing & Fabrication
United Spiral Pipe	Metal Processing & Fabrication

Source: InfoUSA and EquiFax business databases

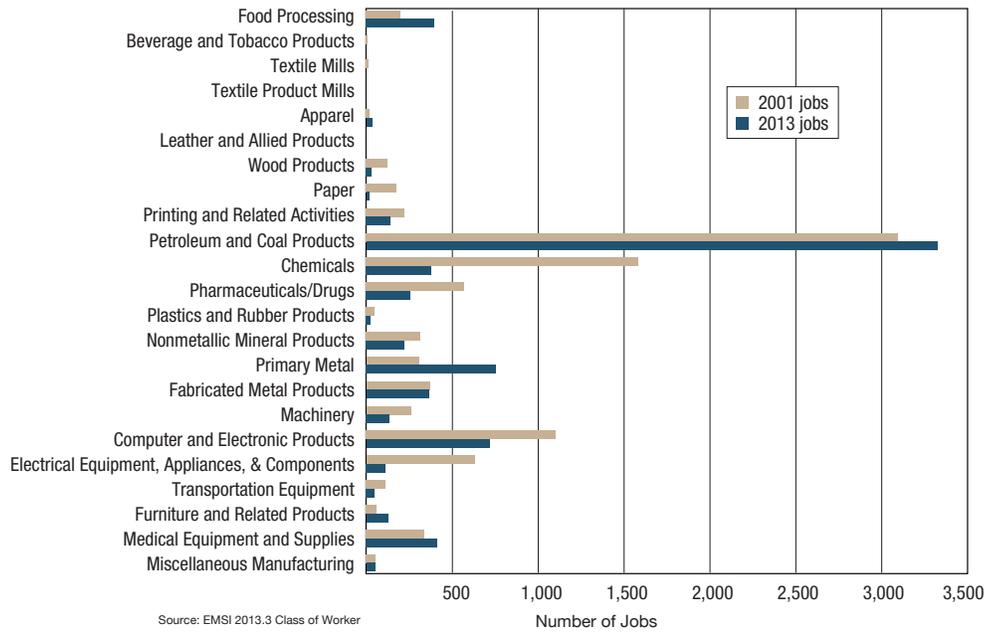
While overall manufacturing employment in the Northern Waterfront has declined, the number of jobs in several subsectors has increased over the past decade. Major decline in employment has occurred in the chemicals, computer/electronic parts, and electrical equipment subsectors; while net new job growth has occurred in food processing, primary metals, petroleum refining, and miscellaneous manufacturing subsectors.

The growth/decline of employment by manufacturing subsector over the past decade is shown in *Figure 4*.

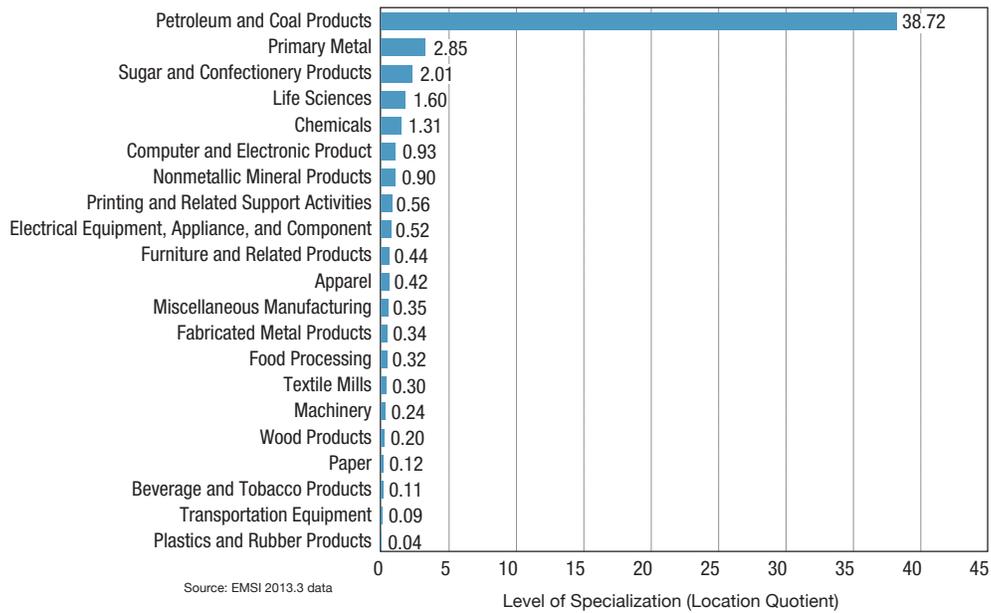
### Competitive Strengths

The Northern Waterfront has competitive strengths in several manufacturing subsectors as depicted in *Figure 5*. Key subsectors include petroleum refining, primary metals, life sciences (biotechnology and medical devices), chemicals, and sugar processing.

**Figure 4: Growth/Decline of Manufacturing Subsectors in the Northern Waterfront 2001-2013**



**Figure 5: Manufacturing Subsectors in the Northern Waterfront Showing Competitive Strengths**



Some subsectors, such as chemicals, have experienced declining employment during the past decade, but are still significant employers. The majority of the manufacturing subsectors, however, have employment concentrations below the national average and declining employment.

To evaluate the competitive strength of the manufacturing subsectors, location quotients (LQ) were used to identify local strengths and potential industry clusters. Location quotients measure the relative concentration of an industry within a region compared to the same industries in the national or state economies. Location quotients greater than 1.0 denote a higher-concentration of employment for an industry within a region than the national or statewide average, which may indicate a possible regional specialization or competitive advantage. Location quotients greater than 1.25 may also indicate that the industry is producing more than can be consumed by the local economy and is serving a larger external market. These export-oriented industries bring new dollars into the local economy, typically pay higher wages, and have high job multipliers which support employment growth in other industry sectors.

### Existing and Emerging Industry Clusters

A number of manufacturing subsectors within the Northern Waterfront show competitive strengths and/or growth rates that could lead to the formation of several industry clusters including transportation fuels (fossil and alternative fuels), chemicals, life sciences, and analytical, scientific, & measuring instruments. Industry clusters are geographic concentrations of competing and collaborating companies in the same or similar industries, as well as the specialized suppliers, service providers, and other related businesses and associated institutions (such as trade associations, universities, and technology transfer centers). Fully developed clusters include the entire value chain of core industries, suppliers, distributors, academic institutions, research labs, workforce training organizations, and professional services such as engineering firms, legal and accounting, and management consultants. Important components also

include a skilled labor force and an adequate physical infrastructure with reliable electric power, water supply, and advanced communications capable of handling the needs of today's industries.

A cluster emerges when there is a "critical mass" of firms that have located in an area and have significant employment concentrations and/or growth rates. Industry clusters tend to form in a region when there are assets and amenities that create a competitive advantage for the companies in the cluster. The proximity of specialized firms within a geographic region results in synergies and higher levels of productivity that attract other firms to the area in order to capitalize on the local competitive advantages.

Industry clusters can be classified into three categories based on their stage of development:

- 1) **established clusters** with core industries that have a significant local presence;
- 2) **nascent clusters** in the early stage of development with industries that are growing faster than the national average, or
- 3) **potential clusters** which are in the process of forming and could develop into a cluster given current market trends and/or public policy stimulation.

None of the clusters in the Northern Waterfront display all the characteristics of a fully developed cluster with a critical mass of core companies and a complete array of related and supporting businesses, associated institutions, and specialized infrastructure (see **Table 2**). The Transportation Fuels Cluster, which is dominated by the petroleum refining subsector, is a mature industry with relatively little net new job creation. Opportunities for growth are based in innovative technologies such as advanced biofuels, which is being driven by public policy.

Several nascent clusters are beginning to emerge in clean technology and food & beverage processing. Opportunities exist for local governments to strengthen these clusters through targeted economic development programs. Other subsectors with competitive strengths

**TABLE 2: Potential Industry Clusters**

Cluster	Critical Mass of Firms in Core Industries	# Firms (2011)	Employment Size (2013)	Growth Rate (2001-2013)	Employment Concentration (LQ)	Significant Local Presence
<b>Energy</b> (fossil & renewable fuels)	Primarily large companies, including refiners such as Shell, Phillips 66, Tesoro, Golden Gate Petroleum, Bay Biodiesel, and Telfer Oil	10	3,126	2.0%	38.72	Part of an established Bay Area energy cluster with suppliers, distributors, and related and supporting businesses. Emerging biofuel industry is included in this cluster.
<b>Chemical Products</b> (part of a diversified manufacturing cluster)	Primarily large established companies, including Rhodia, Criterion Catalyst, General Chemical, Praxair, and Dow Chemical	11	613	-71%	1.11	Mature industry with large scale production facilities.
<b>Life Sciences</b>	Mix of small, medium, & large companies, including Sartorius Stedim Biotech, Bio-Rad, Nordson March Life Sciences, Bay Bioanalytical, Eureka Genomics, and Pacific Biolabs	14	645	-28%	1.60	Part of East Bay regional biotechnology and medical device cluster, including R&D, dental and medical labs
<b>Processed Food &amp; Beverages</b>	Mix of food and beverage manufactures, bakeries, breweries, wineries, bottled water companies, including C&H Sugar, Ramar Foods International, Viano Clement Winery, and Brown Cow West.	16	413	103%	0.36	Small emerging cluster with potential for growth. Several components have competitive strengths including sugar processing and dairy products. Related businesses include packaging and container manufacturers such as Silgan Containers.
<b>Analytical Instruments</b> (part of a diversified manufacturing cluster)	Small number of firms with core companies, such as Pacific Instruments and Diablo Analytical	7	566	-33%	2.06	Companies within this nascent cluster could be part of petro-chemical cluster as a related and supporting business or could be part of a diversified manufacturing cluster.
<b>Metal Processing &amp; Fabrication</b> (part of a diversified manufacturing cluster)	Mix of primary metal and fabricated metal product manufacturers include USS-Posco, United Spiral Pipe, Merit USA, and Signode Western Operations	22	1,047	56.3%	0.83	Cluster anchored by several large companies.
<b>Recycled Materials Processing</b> (part of a clean technology cluster)	Loprest Water Treatment Company, Mt. Diablo Recycling Center, Diablo Solar Services, Solar Universe Diablo Valley, and Suntrek Industries	17	539	142.2%	142.2%	Nascent cluster being driven in part by material shortages and state policies with a goal of zero waste. Part of a larger East Bay cluster with established infrastructure that includes landfills, material recovery and recycling facilities.

Source: Craft Consulting Group research and analysis; Cluster Mapping Project Cluster Definitions; StatsAmerica Innovation in American Regions, Industry Cluster Definitions; EMSI and County Business Patterns data

belong to a diversified manufacturing cluster, which includes primary metal manufacturers, chemical manufacturing, fabricated metal products, machinery manufacturing, nonmetallic mineral products, electronics, electrical equipment, and transportation equipment. Diversified manufacturing includes industries producing different products and using a variety of production methods, but are significant employers in the local economy.

### Proximity to Supplier Networks

As manufacturing cycles become shorter with just-in-time delivery, many manufacturers are requiring their suppliers to locate in close proximity to their production facilities. Manufacturers are also increasingly concerned about the carbon footprint of their supply chains. Having supplier networks in close proximity to the assembly plant allows for just-in-time deliveries while meeting environmental goals. This also represents a key characteristic of a fully developed industry cluster. Proximity to suppliers may be more important for small and medium sized manufacturers than for large global companies. “As a product becomes increasingly sophisticated and complex, requiring unique or specialized suppliers contributing complex subsystems, the need to access advanced global supply networks becomes a priority and the close geographic proximity of a supplier to the final assembly location is less critical.”<sup>2</sup>

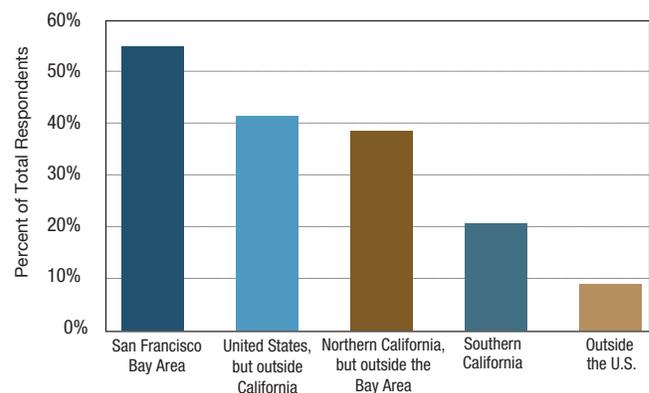
Communities pursuing advanced manufacturing companies may find that the local value-added may be better served with industries that lend themselves to the creation of geographic clusters composed of companies and suppliers in close proximity. The value-added to the geographic region may actually be less, if clusters of like companies and their supply base are not formed in the region as a result of the need to access highly specialized and advanced suppliers in other parts of the world.

A survey of local manufacturers conducted as part of this study found that most supplier networks

<sup>2</sup> World Economic Forum, “Advanced Manufacturing Value-added Paradox: Economic Development Considerations for Policy-Makers”, found at <http://reports.weforum.org/manufacturing-growth/automotive-industry-overview/> November 3, 2013

were concentrated in the Bay Area and Northern California. For most subsectors, only a small number of suppliers supporting existing industries are located in the Northern Waterfront. Approximately 55.2% of the manufacturers obtain their key inputs from Bay Area sources, followed by other U.S. states (41.8%), and northern California (38.8%). Only 9% of the manufacturers responding to the survey sourced their key inputs from overseas (see **Figure 6**). Key inputs imported into the region from other parts of the U.S. or globally include crude oil, semi-finished steel and other metals, industrial gases, chemicals, machined parts, and construction materials.

**Figure 6: Where are the Major Vendors/Suppliers in Your Supply Chain Located?**

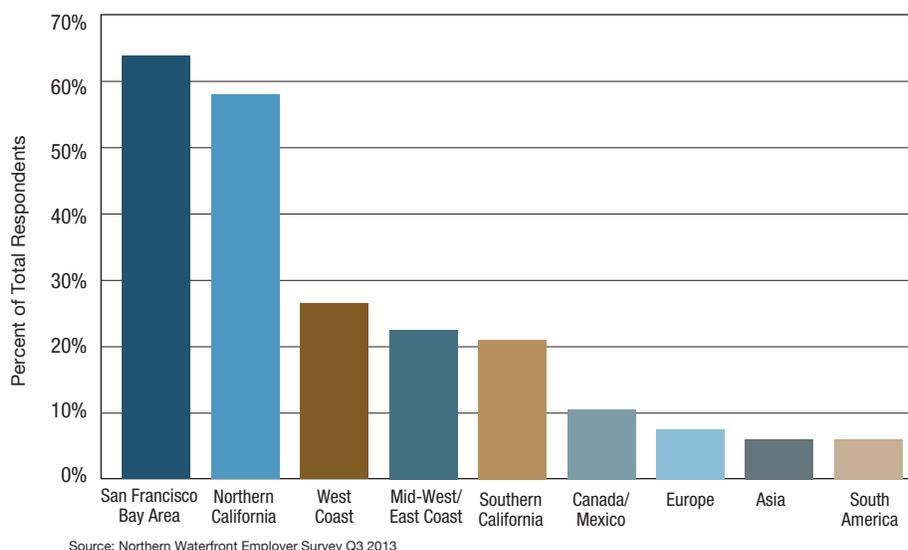


Source: Northern Waterfront Employer Survey Q3 2013

### Location of Primary Markets

Manufacturers in the Northern Waterfront predominately serve major markets in the Bay Area and Northern California, followed by the West Coast, Midwest/East Coast, and Southern California (see **Figure 7**). Only 29.5% of the respondents were exporting their products to foreign markets. For firms that are exporting, the top five export markets are Canada (61.5%), Japan (61.5%), China (53.8%), Mexico (46.2%), and Germany (46.2%). This indicates that there is an opportunity for local manufacturers to expand beyond their immediate markets to other states or export to other countries. However, only 2.1% of the survey respondents identified plans to enter the export market. Some of the reasons for not getting into the

**Figure 7: Where Are Your Major Markets Located?**



export market included: 1) not having an interest in serving the export market in part due to all the paper work involved, 2) difficulty in being able to tap into an overseas market, and 3) having an established client base and distribution network within the Bay Area and Northern California.

Most manufacturers in the Northern Waterfront (93.3%) ship their products predominately by truck, due to the fact that their major markets are located in the Bay Area and Northern California. Airfreight was the second most common method of shipment, used by 31.7% of the manufacturers. Only 15% of the respondents shipped their finished products by water and less than 10% used railroads. Bulk cargo accounts for the largest share of shipment by truck and rail with containerized cargo holding a slight lead in the method of shipment by water.

### Goods Movement System

The industrial areas in the Northern Waterfront are supported by a goods movement system that includes maritime, highway, rail, and pipeline networks. Sourcing raw materials and other inputs essential to the manufacturing process and shipping out finished products to regional, national, and international markets requires an efficient multimodal transportation

system. The industries along the Northern Waterfront utilize various raw materials and semi-processed inputs that are imported either through the Port of Oakland, marine terminals in the Study Area, or shipped from domestic sources by truck and rail. Input commodities sourced internationally and domestically are dependent on competitive transportation and logistics costs as well as the specific requirements of a company's supply chain. Major goods movement infrastructure serving the Northern Waterfront include:

**Maritime Shipping:** The Northern Waterfront primarily handles bulk cargo via private marine terminals, with crude oil and petroleum products being the dominant commodities. Marine terminals and wharfs fronting San Pablo Bay, the Carquinez Strait, Suisun Bay, and the Sacramento-San Joaquin Rivers (see Table A3 in the Appendix) bring in bulk cargo of raw materials and semi-processed inputs used in the manufacture of finished goods. A description of the physical characteristics of the various maritime facilities in the Northern Waterfront is included in **Table A4** in the Appendix. These maritime facilities are critical to the area's industrial operations and primarily serve the adjacent manufacturing operations including:

**TABLE 3: Northern Waterfront Arrivals by Port (2012)**

Foreign Arrivals PORT/BERTH NAME	BERTH CODE	BULK CARRIER	ORE CARRIER	CHEMICAL TANKER	CHEMICAL/ OIL TANKER	CRUDE OIL TANKER	PRODUCT TANKER		TOTAL
<b>Rodeo</b>		<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>1</b>	<b>9</b>		<b>18</b>
Oleum Lower Dock	ROD3	0	0	1	3	1	6		11
Selby	ROD8	0	0	3	1	0	3		7
<b>Crockett</b>		<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>		<b>7</b>
C&H Sugar	CRM1	7	0	0	0	0	0		7
<b>Martinez</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>8</b>	<b>22</b>		<b>40</b>
Shell/Equilon Lower	MRZ2	0	0	0	1	0	1		2
Shell/Equilon Upper	MRZ3	0	0	0	0	4	14		18
Amorco Terminal Tesoro	MRZ5	0	0	0	1	4	3		8
Avon Tesoro Upper Berth	MRZ8	0	0	0	8	0	4		12
<b>Pittsburg</b>		<b>19</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>		<b>19</b>
Posco	PBG4	19	0	0	0	0	0		19
<b>Antioch</b>		<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>		<b>5</b>
Gypsum Dock	ANZ2	3	2	0	0	0	0		5
<b>TOTAL</b>		<b>29</b>	<b>2</b>	<b>4</b>	<b>14</b>	<b>9</b>	<b>31</b>		<b>89</b>
U.S. INTERCOASTAL ARRIVALS PORT/BERTH NAME	BERTH CODE	BULK CARRIER	CATAMARAN TUG	TANK BARGE	CHEMICAL/ OIL TANKER	CRUDE OIL TANKER	PRODUCT TANKER	NON SPECIFIC TANKER	TOTAL
<b>Rodeo</b>		<b>0</b>	<b>0</b>	<b>19</b>	<b>4</b>	<b>2</b>	<b>5</b>	<b>1</b>	<b>31</b>
Oleum Lower Dock	ROD3	0	0	5	1	2	3	1	12
Oleum Center Dock	ROD4	0	0	1	0	0	0	0	1
Oleum Upper Dock	ROD5	0	0	10	0	0	0	0	10
Selby	ROD8	0	0	3	3	0	2	0	3
<b>Crockett</b>		<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>
C&H Sugar	CRM1	0	3	0	0	0	0	0	136
<b>Martinez</b>		<b>0</b>	<b>0</b>	<b>52</b>	<b>14</b>	<b>58</b>	<b>11</b>	<b>1</b>	<b>20</b>
Shell/Equilon Lower	MRZ2	0	0	19	0	0	1	0	40
Shell/Equilon Upper	MRZ3	0	0	21	1	17	1	0	49
Amorco Terminal Tesoro	MRZ5	0	0	0	1	41	6	1	14
Martinez Terminal	MRZ6	0	0	9	4	0	1	0	14
Avon Tesoro Upper Berth	MRZ8	0	0	3	8	0	3	0	1
<b>Pittsburg</b>		<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>
Bay Bulk	PBG3	1	0	0	0	0	0	0	1
<b>TOTAL</b>		<b>1</b>	<b>3</b>	<b>71</b>	<b>18</b>	<b>60</b>	<b>16</b>	<b>2</b>	<b>171</b>

(CONTINUED NEXT PAGE)

**TABLE 3 (CONTINUED): Northern Waterfront Arrivals by Port (2012)**

Bay Area Intercoastal Arrivals PORT/BERTH NAME	BERTH CODE	TANK BARGE	CHEMICAL TANKER	CHEMICAL/ OIL TANKER	CRUDE OIL TANKER	PRODUCT TANKER		TOTAL
<b>Rodeo</b>		<b>23*</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1*</b>		<b>25</b>
Oleum Barge Dock	ROD2	1	0	0	0	0		1
Oleum Lower Dock	ROD3	4	0	1	0	1*		6
Oleum Upper Dock	ROD5	9*	0	0	0	0		9
Selby	ROD8	9*	0	0	0	0		9
<b>Martinez</b>		<b>66*</b>	<b>1</b>	<b>2*</b>	<b>1</b>	<b>3*</b>		<b>73</b>
Shell/Equilon Lower	MRZ2	6*	1	1*	0	1*		9
Shell/Equilon Upper	MRZ3	4	0	0	1	0		5
Martinez Terminal	MRZ6	46*	0	1*	0	1*		48
Avon Tesoro Lower Berth	MRZ7	2	0	0	0	0		2
Avon Tesoro Upper Berth	MRZ8	8*	0	0	0	1*		9
<b>Subtotal</b>		<b>89*</b>	<b>1</b>	<b>3*</b>	<b>1</b>	<b>4*</b>		<b>98</b>

\* Numbers either contain or are vessels that moved from one berth to another within the same port

\*\* Arrivals from unknown ports are not included in the above tables.

Source: San Francisco Marine Exchange

- C&H sugar refinery in Crockett;
- Phillips 66 in Rodeo;
- Tesoro and Shell in Martinez;
- NRG Energy, Dow Chemical, and USS-POSCO in Pittsburg;
- Gypsum Dock in Antioch.

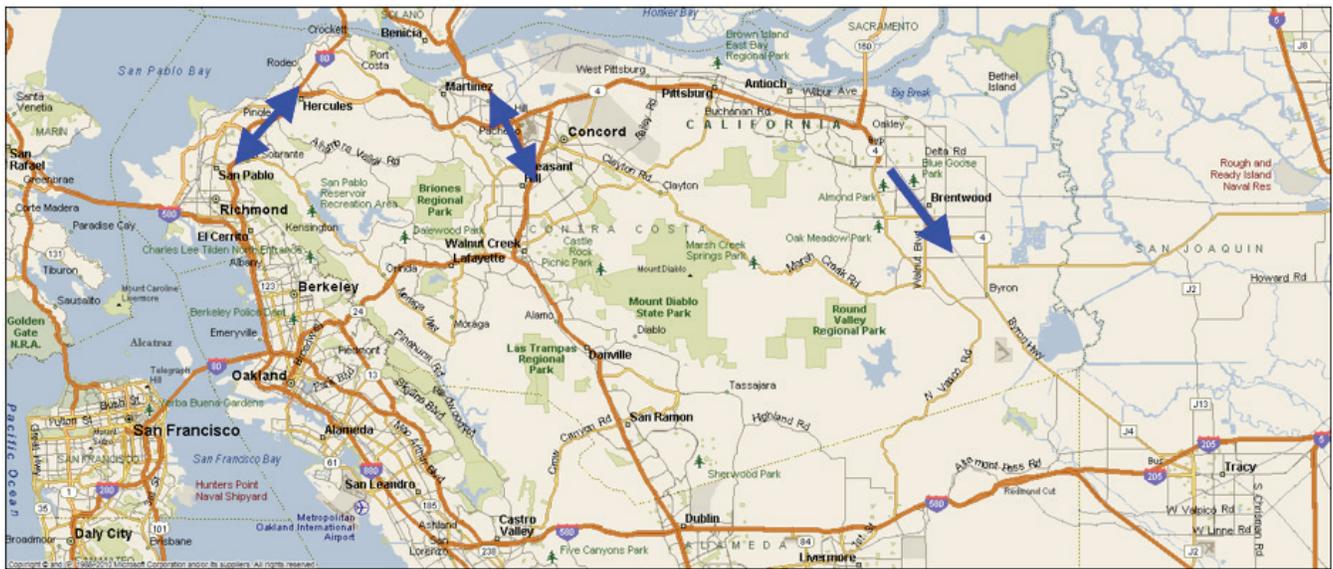
Most of the incoming and outgoing vessels arrive and/or depart from berths in Martinez, followed by Rodeo. **Table 3, above**, shows the number of arrivals in 2012 to marine terminals in the Northern Waterfront by Port, Berth, and Vessel Type.

**Rail Transportation:** Two Class 1 railroads, the Burlington Northern Santa Fe (BNSF) Railway and Union Pacific (UP) Railroad, follow the shoreline and connect the Northern Waterfront with West Coast and farther afield markets. There are no short line railroads serving the area. The railroads helped spur the development of industry along the Northern Waterfront in the late 19th and early 20th centuries, and contributed to Contra Costa County’s growth as a leading manufacturing center.

The City of Hercules is also planning an Intermodal Transit Center which will combine three modes of transportation (train, ferry, and bus) in one convenient waterfront location on San Pablo Bay. Design of the train infrastructure improvements is nearly complete.

Most of the Bay Area’s rail freight activity is concentrated in the East Bay, with major UP facilities in Oakland (Alameda County) and BNSF facilities in Richmond (Contra Costa County). The trend over the last decade has been for the Class I railroads to shift their focus to “hooking and hauling” long trains rather than providing switching and transport service to customers with small volumes of rail cars and intermodal marine containers. More frequently, the Class I railroads are moving long “unit trains” of either rail cars or intermodal marine containers from their origin to destination without interim stops to disassemble and reassemble the train. Unit trains are entire trains of railcars dedicated to a single cargo. Under this new operating model, businesses in the Northern Waterfront may find it challenging to obtain rail service unless they have consistent large volumes of cargo. Another option for consideration would be

**Figure 8: Connectivity of Northern Waterfront to Principal Transportation Corridors**



To I-80/880 and  
Bay Area

To I-680 and  
Silicon Valley

To I-5 and  
Central Valley

a short line railroad to serve the area, similar to the Richmond Pacific Rail Corporation (RPRC), which provides switching for the Port of Richmond and serves industries on 10 miles of track in the Richmond area. RPRC interchanges with both UP and BNSF. Cargo traffic includes stone, ores, lumber, food products, and petroleum products.

**Truck Routes:** State Route (SR) 4 is the principal east-west transportation corridor serving the Northern Waterfront. SR 4 connects with I-80 on the west and I-680 in central Contra Costa County. On the eastern end SR-4 is undergoing major improvements with the possibility of an extension all the way to Tracy, opening up a direct route to the Central Valley and Interstate 5. Currently, the SR-4 Bypass in East Contra Costa is more of a local road that connects with two-lane J-4 Byron Highway near Byron. A direct connection is lacking to the I-580/I-205 corridor. A feasibility study is currently being completed for a transportation facility (proposed SR-239) that would connect SR-4 near Brentwood to the Interstate 580/205 corridor near Tracy. This would provide an effective truck route serving East Contra Costa and manufacturing firms in the Northern

Waterfront with access to Central Valley and Southern California markets. I-80 serves as a connector to the transcontinental truck network, while I-5 serves West Coast markets from southern California to Oregon and Washington. Connectivity to principal transportation corridors is shown on *Figure 8*.

**Pipeline Networks:** Pipelines running across the region serve the needs of the refiners and liquid bulk shippers. Export commodities handled at the marine terminals and tank farms in the Northern Waterfront are limited primarily to oil and refined petroleum and petrochemical products.

## Commodity Flows and Goods Movement

Most of the products manufactured in the Northern Waterfront are destined for California and other U.S. markets. Some products are exported to foreign destinations. Trucks carry the largest share of domestic trade in terms of both tonnage and value. Several of the region’s major freight corridors provide critical truck access to domestic markets. Petroleum products

represent 27% of the Bay Area's outbound tonnage, which shows the importance of the petroleum refining sector to the region. Approximately 46% of all the tonnage transported through the Bay Area moves entirely within the nine-county region. The major economic activities include warehousing and distribution of goods from warehouses to retailers and consumers, and the movement of construction materials to support the housing and commercial real estate markets. Urban goods movement is conducted almost exclusively by trucks.

The major inbound commodities to the region are primarily raw materials and inputs used in the production of finished products.<sup>3</sup> Major commodities shipped into the Northern Waterfront from elsewhere in the U.S. include non-metallic minerals, crude oil, construction materials, and food products. Major commodity flows into and from the Northern Waterfront include:

**Receipt of Crude Oil and Shipment of Petroleum Products:** The import of crude oil into the Northern Waterfront and the shipment of refined petroleum products to distributors and end user markets play an important key role in both the local and regional economy. Transportation of crude oil and petroleum products is a major component of the Northern Waterfront's goods movement profile.

Crude oil comes from four major sources:

- 1) pipelines from major producing regions in the Central Valley and Southern California,
- 2) oil tankers from Alaska,
- 3) ships from overseas producers, and
- 4) rail cars from North Dakota's Bakken Oil Fields.

Tankers loaded with crude oil enter marine terminals along the Northern Waterfront where the crude is then sent to refineries for processing via pipelines running under or adjacent to a wharf. Marine terminals that handle crude oil along the Northern Waterfront serve the three refineries located in Rodeo (Phillips 66), Martinez (Shell), and north Concord (Tesoro). Finished

<sup>3</sup> Ibid.

products like gasoline and diesel are distributed primarily by rail or tank truck, but are also loaded and shipped out through the same marine terminals. The refinery process is continuous, requiring accumulation of inventory in tank farms; several of which are located at terminals near the refineries. Tank trucks make deliveries of refined petroleum products, such as gasoline, to service stations throughout the Bay Area and Northern California.

The transportation of crude oil and petroleum products by rail is expected to increase as more domestic oil is used by local refineries. WesPac Energy, for example, has proposed refurbishing a former oil storage and transfer facility along the Pittsburg waterfront adjacent to the NRG Power Plant to unload crude oil from ships and rail cars and store it in tanks, then send it through pipelines to local refineries. Rail delivery is being added at the request of local oil refineries, which are looking to use more domestic crude oil from Midwest oil fields. Rail transport of fuel components, such as ethanol and liquefied petroleum gas, into and out of California is also becoming a more significant part of the State's fuel supply system.

**Receipt of Unrefined Sugar and Shipment of Packaged Refined Sugar:**

The process of separating sugar from the sugarcane plant is accomplished through two steps - sugar mill crushing and sugar refinery extraction. Sugarcane is initially processed into raw sugar at mills near the cane fields. Because cane is bulky and relatively expensive to transport, it must be processed as soon as possible to minimize sugar deterioration. The raw sugar is then shipped to refineries to produce refined sugar. The final products of refining include powdered, granulated, and brown sugar. The refining process involves several stages of washing, clarifying, and filtering the raw product. This requires a lot of water and treatment of the wastewater at a nearby treatment facility, which cleans the wastewater before it is pumped into the Bay.

C&H Sugar Refinery in Crockett, which has the largest capacity of any U.S. sugarcane refinery, processes over 700,000 tons of pure cane sugar annually. Unrefined sugar is sourced from several locations. While Hawaii

currently contributes some raw sugar to the refinery's output, most now arrives from Australia, the Philippines, Nicaragua, and other countries.

**Receipt of Semi-Finished Metal:** USS-POSCO Industries (UPI) manufactures sheet and tin mill products for markets principally in the western U.S. USS-POSCO operates a steel-finishing mill to produce cold-rolled sheets, HRPO (hot rolled pickled & oiled), galvanized, and advanced high strength steel (AHSS) sheets, and tin plate and tin-free steel from hot bands supplied primarily by U. S. Steel and Korean steel maker POSCO. The UPI facility receives semi-finished steel at the wharf by barge and vessel. Two connecting rail tracks run the length of the wharf and connect with the BNSF and UP lines adjacent to the property.

United Spiral Pipe makes spiral pipe primarily for the North American oil and gas industry. Both U.S. Steel and POSCO supply United Spiral Pipe with sheets of rolled steel used in the process. The pipe factory was built adjacent to the existing USS-POSCO steel plant in Pittsburg and will use existing UPI shipping and rail systems to transport raw materials and finished pipe products to and from the site.

Silgan Containers is the largest manufacturer in North America of steel and aluminum metal food containers that are used primarily by processors and packagers for food products, such as soup, vegetables, fruit, meat, tomato based products, coffee, seafood, adult nutritional drinks, pet food, and other miscellaneous food products. Silgan uses tin plated and chromium plated steel, aluminum, copper wire, organic coatings, lining compound and inks in the manufacture and decoration of its metal food container products. The company is dependent upon a limited number of suppliers for steel, aluminum, coatings and compound raw materials required for making containers. A key factor in site location is proximity to their customers through its widespread geographic presence. Because of the high cost of transporting empty containers, Silgan strategically locates its manufacturing plants within a 300 mile radius of its customers to give it a competitive advantage over companies in other areas.

**Receipt and Shipment of Caustic Soda and Shipment of Petroleum Coke:** Diablo Service Corporation, which receives caustic soda by barge and ships petroleum coke by vessel, operates a wharf along New York Slough in Pittsburg. Diablo uses one of the surface rail tracks linking the wharf to an open storage area in the rear. The Diablo area is connected by one stainless steel pipeline to a one million gallon capacity caustic soda storage tank located at the terminal in the rear. The open storage area has space for 75 thousand tons of bulk material.

Dow Chemical Company owns and operates the Pittsburg Plant Wharf to ship and receive caustic soda. Rail trackage in the rear of the plant connects to the BNSF line. The wharf is connected by a pipeline to steel storage tanks with total capacity in excess of 3.4 million gallons.

**Receipt of Construction Materials:** Georgia Pacific's Antioch plant produces gypsum wallboard and plaster interior and exterior gypsum panels for residential housing and commercial buildings. A San Leandro facility produces gypsum wallboard face paper. Wallboard and joint compounds are manufactured from natural and synthetic mineral gypsum. Rock is milled, calcined (heated), hydrated, and continuously formed into drywall at the Antioch plant. Synthetic gypsum is a byproduct of coal-fired power plants. The Antioch manufacturing facility sources gypsum extracted from mineral deposits located on San Marcos Island, Mexico in the Gulf of Baja California and paper facers from its San Leandro facility. The largest volume of gypsum production in Mexico is from San Marcos Island where an open pit mine and deep water ship loading facilities are operated to produce and ship crushed gypsum rock.

## Commodity Flow Analysis

To better understand the movement of goods into and out of the region, a rudimentary commodity flow analysis was performed using the U.S. Federal Highway Administration's Freight Analysis Framework version 3<sup>4</sup> (FAF3) database. FAF3 uses data from the

4 [http://www.ops.fhwa.dot.gov/freight/freight\\_analysis/faf/](http://www.ops.fhwa.dot.gov/freight/freight_analysis/faf/)

2007 Commodity Flow Survey<sup>5</sup> (conducted as part of the U.S. Economic Census) and additional sources, to provide estimates for tonnage and value by region of origin and destination, commodity type, and mode of transportation to provide forecasts through 2040. Figures A3 and A4 in the Appendix show the outbound commodity flows in tonnage and value for the Bay Area FAF zone in 2011 and 2035. Some of these commodities, such as crude petroleum, non-metallic minerals, base metals and basic chemicals are likely imported through the existing marine terminals in the Northern Waterfront, and other commodities, such as gasoline, coal (not elsewhere classified or other coal and petroleum products), pharmaceuticals, chemical products and fuel oils are likely produced by existing industries in the Northern Waterfront.

When comparing the 2035 forecasted flows by weight with those in 2011, it is apparent that basic chemicals (which show a compound annual growth rate or CAGR of about 3.7%); natural sands (3.4% CAGR) and chemical products (3.1% CAGR) are likely to see high growth. In addition, moderate growth in tonnage is likely to be seen in non-metal mineral products (2.7% CAGR) and gasoline (2.2% CAGR). Comparing flows by value from 2011 to projected flows in 2035, a majority of the products are likely to see high compound annual growth rates, such as precision instruments (7.8%), pharmaceuticals (6.6%), and machinery (5.0%). Other commodity flows with high growth rate in value include miscellaneous manufacturing (4.7%), mixed freight (4.5%), and chemical products (3.3%). Due to the existing mix of industries, marine terminals, and vacant lands for industrial development, the Northern Waterfront is well-positioned to absorb the projected growth of these commodities. Mixed freight, however, consists mainly of containerized cargo, and in the absence of marine terminals in the Northern Waterfront to handle containerized cargo, these commodity flows will continue to be shipped through the Port of Oakland.

<sup>5</sup> [http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/commodity\\_flow\\_survey/index.html](http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/commodity_flow_survey/index.html)

**Input-Output Analysis:** Using the IMPLAN (IMpact analysis for PLANning) input-output model, a widely accepted economic impact analysis tool created by MIG (formerly “Minnesota IMPLAN Group, Inc.”), from the 2013 Caltrans’ Bay Area Freight Mobility Study indicates that Contra Costa County has a higher percentage share of total output for Goods Movement Industries than the Bay Area as a whole, as shown in **Table 4**, although the County’s share of total employment is slightly lower. This is likely driven by the high valued refinery and other manufactured products along with significant process automation in large-scale manufacturing.

## Land Use

The Northern Waterfront includes six cities, several unincorporated communities, regional parks, and federal and state owned land. A number of parcels are not available for development including the Military Ocean Terminal Concord (formerly the tideland area of the Concord Naval Weapons Station), Point Ozol Defense Fuel Support, refinery buffer zones, Acme Landfill; and a variety of open space and wildlife sites including the Antioch Dunes National Wildlife Refuge, Bay Point Regional Shoreline, Pacheco Marsh, PG&E Wetlands, Peyton Slough Marsh, Point Edith State Wildlife Area, Martinez Regional Shoreline, Carquinez Strait Regional Shoreline, and Water Bird Regional Preserve.

The Northern Waterfront includes approximately 63.89 square miles of land area. The major regional parks, open space, and military owned parcels account for approximately one third of the land area. Various urban land uses make-up the remaining balance of the land area within the Northern Waterfront Study Area. Less than 40% of the land is currently designated for industrial use. There are 737 parcels of varying sizes designated as industrial being used for a variety of purposes with the largest number in government use (see **Table 5**). Of the developed parcels, approximately 4,243 (or 29%) are used for industrial purposes with another 1,412 acres (or 9.5%) of undeveloped industrial land.

**TABLE 4: Bay Area Region and Contra Costa County Economic Profiles, 2011**

Industry	Output, 2011 (\$ millions)				Employment, 2011			
	Bay Area	% of Total	Contra Costa	% of Total	Bay Area	% of Total	Contra Costa	% of Total
Agriculture, Farm, and Forestry	3,652	0.4%	176	0.1%	23,435	0.5%	1,552	0.3%
Wholesale trade	28,210	2.9%	1,990	1.3%	138,633	3.2%	10,437	2.2%
Manufacturing	365,895	37.7%	89,528	58.1%	324,551	7.5%	21,506	4.5%
Construction	27,615	2.8%	3,701	2.4%	196,063	4.5%	26,433	5.6%
Retail trade	33,348	3.4%	4,024	2.6%	399,830	9.3%	52,146	11.0%
Utilities	10,389	1.1%	2,259	1.5%	12,940	0.3%	2,395	0.5%
Rail transportation	481	0.0%	24	0.0%	1,158	0.0%	49	0.0%
Truck transportation	3,277	0.3%	458	0.3%	23,878	0.6%	3,309	0.7%
Water transportation	1,317	0.1%	264	0.2%	2,301	0.1%	427	0.1%
Air transportation	5,799	0.6%	19	0.0%	17,692	0.4%	73	0.0%
Other transportation	7,412	0.8%	1,014	0.7%	60,244	1.4%	9,051	1.9%
Warehousing and storage	730	0.1%	33	0.0%	7,930	0.2%	375	0.1%
Mining (includes oil & gas exploration)	2,179	0.2%	1,165	0.8%	4,580	0.1%	2,145	0.5%
<b>Goods Movement Industries Sub-Total</b>	<b>490,304</b>	<b>50.5%</b>	<b>104,656</b>	<b>68.0%</b>	<b>1,213,235</b>	<b>28.1%</b>	<b>129,898</b>	<b>27.5%</b>
Government (Federal, State, and Local)	48,249	5.0%	4,543	3.0%	431,120	10.0%	45,553	9.6%
Services	432,537	44.5%	44,778	29.1%	2,665,856	61.8%	297,383	62.9%
<b>TOTAL - All Industries</b>	<b>971,091</b>	<b>100%</b>	<b>153,976</b>	<b>100%</b>	<b>4,310,212</b>	<b>100%</b>	<b>472,835</b>	<b>100%</b>

Source: IMPLAN, 2011

### Parcel Size

Industrially zoned parcels in the Northern Waterfront range in size from less than an acre to more than 625 acres. The majority of parcels are one to 10 acres in size, followed by parcels of less than one acre (see *Figure 9*). The minimum parcel size for light industrial and warehouse uses is typically 5,000 to 7,500 square feet. Parcels for heavy industrial uses tend to be larger due to facility size, setback requirements, loading (truck or rail,) and parking. It is important that local governments have a sufficient amount of industrial zoned land to meet current and projected space needs of manufacturing firms. Out of 109 total vacant parcels, 85 parcels are unimproved and zoned for industrial development.

### Number, Type, and Age of Industrial Buildings in the Northern Waterfront

There are over 1,100 industrial buildings in the Northern Waterfront, most of which are older warehouse type structures. As indicated in *Figure 10*, the average age of the building stock is 39 years, which is slightly younger than the average age of warehouse buildings in Alameda County (42 years). Approximately 39.2% of the buildings in the Northern Waterfront are more than 50-years old. Much of what remains vacant on the market for lease are older outdated properties bordering on obsolescence. Functional obsolescence can occur due to a building's age, outdated floor plan, ceiling height, column spacing, higher heating and cooling costs or other factors that require extensive

**TABLE 5: Industrial Parcels in the Northern Waterfront**

Land Use	Number of Parcels	Number of Acres	% of Total Industrial
Agriculture	10	723	4.9%
Commercial	10	16	0.1%
Government	218	7,971	53.5%
Heavy Industrial	86	2,565	17.2%
Light Industrial	190	1,678	11.3%
R&D	3	35	0.2%
Public	4	15	0.1%
Residential	92	86	0.6%
Recreational	13	118	0.8%
Vacant Industrial	85	1,412	9.5%
Vacant Residential	13	219	1.5%
Vacant Commercial	11	49	0.3%
Pipelines/Canals	2	4	0.03%
<b>Total Industrial</b>	<b>737</b>	<b>14,891</b>	<b>100.0%</b>
<b>% of Total Acreage</b>		<b>36.4%</b>	
Total Acreage - Northern Waterfront Study Area		40,890	

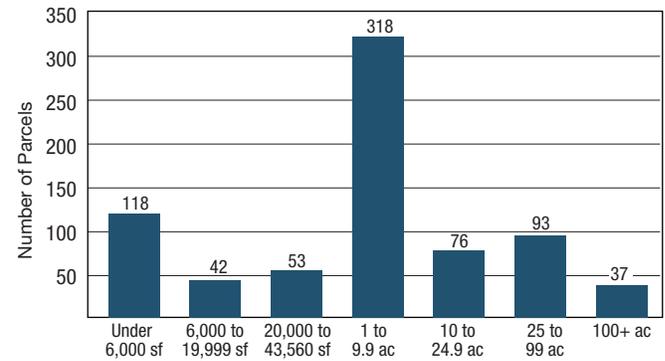
Source: First American Title Company

remodeling or limit the usability of the building for modern industrial activities and the cost of remodeling is higher than demolition and rebuilding. Obsolescence occurs because a replacement or substitute property is available that has more advantages than the cost and inconvenience of modernizing the subject property. Functional obsolescence does not include physical deterioration or economic factors that depress a property's value.

### Industrial Real Estate Market

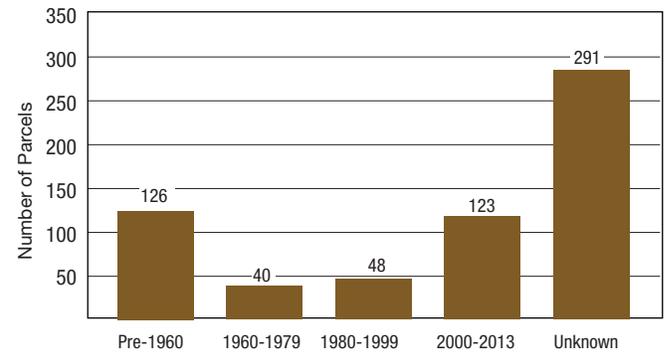
The East Bay represents the largest industrial (manufacturing and warehouse space) real estate market in the Bay Area with a building base in excess of 196 million square feet of industrial space (see **Table 6**). The East Bay industrial market, which includes Alameda and Contra Costa counties, is divided into several geographic subareas (Oakland, Pleasanton, and Walnut

**Figure 9: Parcel Sizes**



Source: First American Title Company

**Figure 10: Age of Structures**



Source: First American Title Company

Creek). The East Bay/Walnut Creek subarea (see **Figure II**), which includes most of the northern waterfront, led all other Bay Area warehouse markets in terms of occupancy growth through the first nine months of 2012. During the past twelve months the vacancy rate has fallen from 13.4% to 11.2%. Although the average asking rent has moved up in the past three months, significant rental rate growth is unlikely until vacancies fall further. The East Bay submarket also has the largest amount of vacant space and lowest average asking rents. Almost half of the available space (48.7%) is small, less than 2,500 square feet in size while large spaces over 20,000 square feet only make up 20% of the available space. Demand for properties from owner-users remains strong due to affordable pricing and low interest rates. Overall, the market continues to strengthen and is expected to show positive net growth over the next quarter.

**TABLE 6: Bay Area Industrial Real Estate Submarkets (in square feet)**

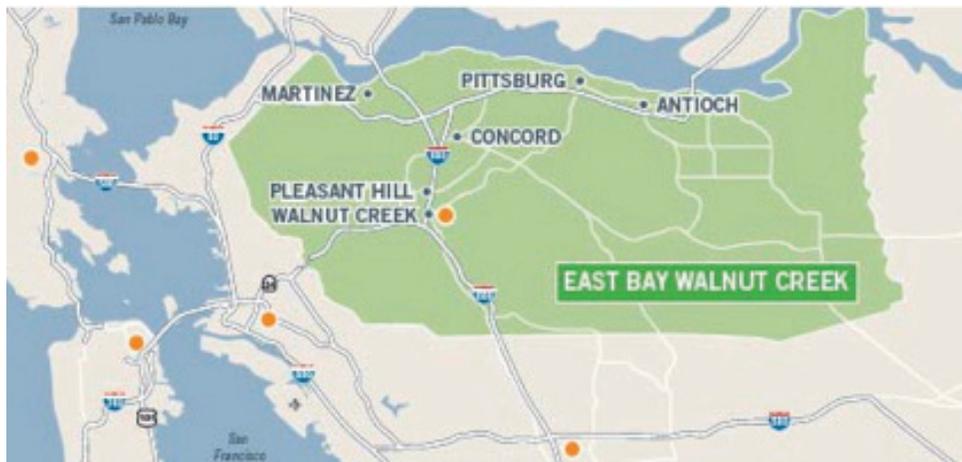
Submarket	Industrial Building Base	Total Available	Vacancy Rate	Average Asking Rent Per Sq. Ft.
North Bay (Marin, Sonoma, Napa)	32,714,708	2,220,807	6.8%	\$0.78
San Francisco	20,433,162	1,227,454	6.0%	\$1.00
San Mateo	40,027,776	2,429,267	6.1%	\$0.75
Santa Clara	83,636,409	5,523,830	6.6%	\$0.58
<b>East Bay</b>	<b>196,638,104</b>	<b>13,687,939</b>	<b>7.0%</b>	<b>\$0.48</b>
Oakland	162,078,590	10,126,409	6.3%	\$0.43
Pleasanton	17,839,146	1,755,378	9.8%	\$0.67
Walnut Creek	16,610,013	1,806,152	10.9%	\$0.68
Central (Martinez, Concord)	8,743,492	671,497	7.7%	\$0.83
East (Bay Point, Pittsburg, Antioch)	6,559,943	925,904	14.1%	\$0.34
Solano	27,058,650	3,950,961	14.6%	\$0.44
<b>Bay Area Industrial Space</b>	<b>400,508,809</b>	<b>29,040,258</b>	<b>7.3%</b>	<b>\$0.57</b>
<b>Northern Waterfront</b>	<b>13,731,865</b>	<b>1,283,151</b>	<b>9.3%</b>	<b>\$0.43</b>

*\*Most of the Northern Waterfront is included in the East Bay/Walnut Creek submarket.*

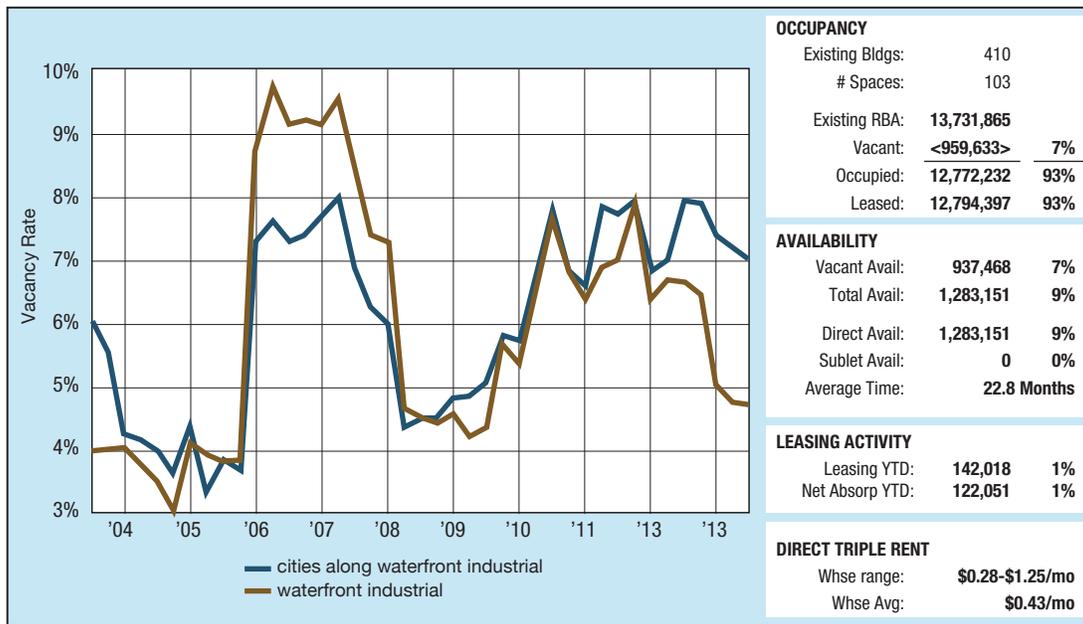
*A portion of the Northern Waterfront is included in the East Bay/Oakland submarket.*

*Source: Cassidy Turley, Q2-2013 LoopNet, September 2013*

**Figure 11: East Bay/Walnut Creek Industrial Submarket**



**Figure 12: Northern Waterfront Industrial Vacancy Rate Trends**



The Northern Waterfront with a total of 13,731,865 square feet of industrial space, not including owner-occupied manufacturing facilities such as refineries, represents 82.7% of the East Bay/Walnut Creek subarea industrial real estate market. Approximately 1,283,151 square feet are available for lease, representing a 9.3% vacancy rate.

Vacancy rates in the Northern Waterfront declined in the early-2000's during good economic times when the demand for industrial real estate was high (Figure 12). Beginning in late 2005, vacancy rates started to increase before peaking in 2007. Following the end of the recession the vacancy rate increased, but has been dropping since mid-2012. The current vacancy rate stands at around 9.3% with net absorption around 122,000 year-to-date in 2013. Asking rental rates range from around \$0.28 to \$1.26 per square foot (depending on location and quality), with an average asking rental rate of \$0.43 per month triple net. A listing of available industrial space for lease or sale can be found online

at [www.loopnet.com](http://www.loopnet.com), or the websites of industrial real estate brokers serving the Contra Costa County market including Cassidy Turley and Colliers International. In comparison with other industrial real estate submarkets in the Bay Area, the Northern Waterfront offers a competitive location with affordable rents.

Real estate market data for industrial properties typically do not track small industrial buildings less than 5,000 gross square feet, owner-occupied buildings, or heavy industrial and special use facilities. Industrial properties such as refineries, petro-chemical plants, steel fabrication, and other large owner-occupied manufacturing facilities also are not included in the industrial real estate market data. Most large industrial facilities that are owner-occupied have been around for 50 years or more. Electrical power generating plants built in the past 15 years in East Contra Costa also are not included.

## Existing Industrial Parks

Much of the industrial space available for lease in the Northern Waterfront is located in business and industrial parks that have been developed over the past 30-plus years. The business and industrial parks are suitable for a variety of industrial uses including light industrial, wholesale, assembly, research and development, manufacturing, warehouse and distribution uses. Business parks include:

- North Shore Business Park is a master planned development located off San Pablo Avenue near the I-80/SR-4 interchange in Hercules;
- Empire Business Park offers warehouse/manufacturing and office space located off Willow Pass Road with access to SR 4 from Railroad Avenue in Pittsburg;
- Delta Business Park is a mixed use master planned development located near the intersection of SR-4 and Somersville Road in Antioch;
- Mason Industrial Park, Gateway Industrial Park, Concord Business Park, and Garaventa Business Park located in North Concord.



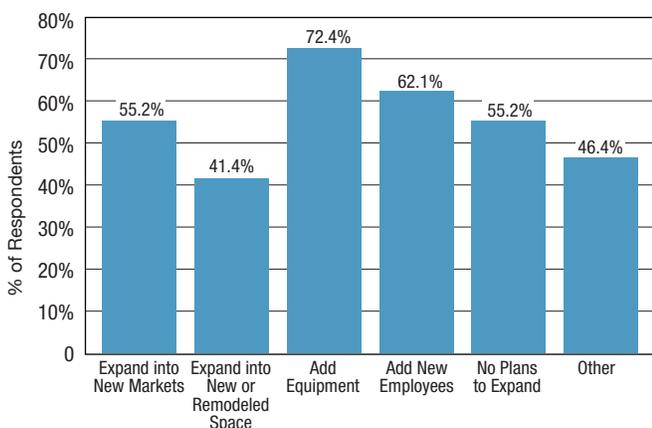
# Emerging Opportunities

**A** NUMBER OF GLOBAL AND REGIONAL TRENDS are converging that will present opportunities for expansion of the manufacturing sector along the Northern Waterfront, provided that local jurisdictions collaborate on a regional basis to address the challenges and impediments present in the Northern Waterfront, and jointly pursue the attraction of new industries.

## Growth and Expansion of Local Manufacturing Firms

The Northern Waterfront's existing industrial base includes 189 manufacturing firms spread across a number of manufacturing subsectors. Many of these firms are expected to grow by adding jobs, increasing output, and expanding their facilities. A survey of 48 manufacturing firms in the Northern Waterfront between August 27, 2013 and October 2, 2013 found that 44.8% of the manufacturers had plans to grow their business over the next three to five years by expanding into new markets, adding equipment, or hiring new employees. **Figure 13** shows a breakdown of the respondents' expansion plans. Of those firms with growth plans, 41.4% planned on expanding into new or remodeled space because of employment growth or the need for modern facilities. Others were looking to add new equipment or expand into new markets.

**Figure 13: Expansion Plans of Existing Manufacturing Firms in the Northern Waterfront**



Source: Survey of Manufacturing Firms in the Northern Waterfront, Aug/Sept 2013

## Rise of Advanced Manufacturing

The rise of advanced manufacturing is helping American manufacturers to be more competitive, which enables them to grow and expand. Today's new manufacturing economy uses advanced manufacturing processes and systems to produce everything from jet aircraft, computers and semiconductors, medical devices, and vehicles, to sophisticated chemical and biological compounds. Innovative technologies have led to the emergence and growth of new industries such as biotechnology, advanced biofuels, solar photovoltaics, three-dimensional (3D) printing, nanotechnology, and clean technology. Traditional industries have adopted advanced manufacturing processes and systems in order to remain competitive.

Although innovation is making manufacturing firms more competitive, increasing automation is likely to lead to slower employment growth.<sup>6</sup> Incorporating advanced technologies into the manufacturing process requires fewer, but better trained workers with higher skills than in the past when manufacturing jobs consisted largely of physical labor and assembly line work. Trends such as globalization of the supply chain, mass customization, shortening of product lifecycles, low inventory, and quick response requirements will also make modern manufacturing operations more dependent on efficient goods movement infrastructure and services.

A workforce survey<sup>7</sup> of 131 advanced manufacturing firms in Contra Costa County with 10 or more employees, conducted between December 2012 and February 2013, found that while the manufacturing sector in general was declining, advanced manufacturing firms expected to grow and expand. When asked how many employees they expected to hire over the next three to five years, staffing levels were up about 2.5%. Compared to manufacturing firms in general, which are experiencing little if any growth,

6 Institute for Defense Analysis, "Emerging Global Trends in Advanced Manufacturing", March 2012

7 Contra Costa County Workforce Development Board, "Advancing Manufacturing in Contra Costa County", June 2013

advanced manufacturing firms in Contra Costa County are growing and hiring new employees. Many of these firms are located along the Northern Waterfront. With the right strategies, the Northern Waterfront could benefit from the expansion of advanced manufacturing firms currently located in the region as well as leverage its strengths to attract new advanced manufacturing firms looking to relocate.

## Resurgence and Reshoring of Manufacturing Jobs

The reshoring of manufacturing jobs back to the U.S. from overseas will lead to a general expansion of the manufacturing sector nationally. After seeing American jobs moved overseas for the past several decades, the U.S. manufacturing sector recorded net new job growth in recent years fueled by increasing labor costs in other countries and rising transportation costs. Since 2009, U.S. manufacturing industries have recorded increases in both total output and employment. Over the next decade, it is expected that more American companies will be evaluating whether to bring some of their manufacturing operations back from overseas. Rising wages in other countries, increasing global transportation costs, political instability abroad, and a desire to manufacture closer to consumer markets are all factors affecting the decision to remain [in] or return to the U.S. Industries most likely to grow or reshore in the U.S. in the coming decade are those which manufacture products that are more capital intensive, while labor intensive jobs will continue to be moved offshore. Boston Consulting Group states that the “sectors most likely to return [to the U.S.] are transportation, electrical equipment and appliances, furniture, plastics, rubber products, machinery, fabricated metal products, and computers/electronics.”<sup>8</sup> The Northern Waterfront should position itself to capture some of the companies looking to reshore part of their manufacturing operations.

<sup>8</sup> Boston Consulting Group, “*Made in America, Again: Why Manufacturing Will Return to the U.S.*”, August 2011

A cyclical rebound in the United States manufacturing sector is under way, but this one is buttressed by new—and potentially long-enduring—structured changes.

—PwC Report on U.S. Manufacturing Resurgence

A study released by the NAIOP Research Foundation<sup>9</sup> in early June 2013 concludes that the reshoring trend of manufacturing industries to the U.S. will stabilize the loss of manufacturing jobs over the next decade. Certain industries will add jobs while others shed them. Companies will be strategic in selecting locations that decrease transportation costs, enhance their operations, and are located closer to consumers and skilled labor. The opportunity for the Northern Waterfront is to be prepared with a skilled workforce to fulfill the job demand, invest in necessary infrastructure, and market the region as a location for advanced manufacturing in targeted industries. Manufacturers that adjust their location strategies to grow or expand in the U.S. are potential targets for business attraction programs along the Northern Waterfront.

## New and Emerging Industries

Emerging industries arise from and are created by changes in technology, regulations, or market demand. The Bay Area is a hot bed for innovation due to the number of research universities, national labs, venture capital, and a culture of innovation and entrepreneurship. Companies in new industries emerging from these innovation centers that are in the early stages of development often desire to manufacture close to their R&D and product development headquarters. These emerging industries may be good candidates for the Northern Waterfront because of its proximity to Bay Area research centers.

<sup>9</sup> NAIOP Research Foundation, “*Stabilization of the U.S. Manufacturing Sector and Its Impact on Industrial Real Estate*”, June 2013

Clean technology industries (see *Table A11* in the Appendix for a description of cleantech market segments) focused on renewable energy generation, energy efficiency, energy storage, water purification, recycling, waste processing and treatment, emission controls, and other segments that are developing innovative technology to address environmental challenges or reduce resource consumption are potential target industries for the Northern Waterfront.

Start-up companies using technology developed at research labs and universities in the Bay Area are also potential targets. For example, Lawrence Livermore National Laboratory (LLNL) scientists have created innovative technologies that could play an important role in producing clean water and energy. One technology for separating salt and other ionic compounds from seawater or brackish water and for reclaiming wastewater for use in crop irrigation and manufacturing processes has been licensed to a local company based in Hayward. Another technology represents a robust and low-maintenance path for efficiently and cost-effectively producing clean drinking water from seawater and brackish water. LLNL also has developed an electromechanical battery with a highly efficient solution for alternative energy systems without the need for electrical power. The Northern Waterfront could serve as a manufacturing location for early-stage companies using technology developed at local research centers in the Bay Area.

Proximity to both the Montezuma Hills wind farms in Solano County and the Altamont Pass Wind farms in Alameda and Contra Costa counties along with good access to water, rail, and highway make the Northern Waterfront an ideal location for the fabrication, repair, maintenance, and refurbishment of wind turbines and blades.

Public policies that encourage the production of advanced biofuels are driving the demand for and growth of biofuels in California. A recent case study<sup>10</sup> by the Environmental Defense Fund and Environmental

<sup>10</sup> Environmental Defense Fund and Environmental Entrepreneurs, “Biodiesel in California: Companies Fueling Positive Change”, August 2013

Entrepreneurs found that the federal Renewable Fuels Standard and California’s Low Carbon Fuel Standard, which calls for lower emissions from transportation fuels, are encouraging the production of biofuels from waste oils and other sources. The case study profiled six biofuel manufacturers that are expanding the commercialization of low-carbon fuels with production capacities up to 20 million gallons a year. These and other biofuel companies are working to supply the oil refineries and the U.S. Navy with lower carbon fuels. If biodiesel manufacturers continue to expand in California as planned, the advanced biofuels industry will have the ability to produce up to nearly three billion gallons of low-carbon fuel by 2015. According to the report, the biofuels market has the potential to be worth more than \$60 billion within the next decade, creating over 18,000 jobs from the nearly 30 bio-refineries expected to open by 2015 in the U.S. **The Northern Waterfront is an ideal location for a biofuel refinery due to its proximity to multiple feedstock sources; adjacent rail, maritime, highway, and pipeline infrastructure; availability of natural gas, electricity, and water (including recycled water) utilities; and proximity to oil refineries and northern California markets.** The Northern Waterfront could capitalize on the domestic trade linkages with the Central Valley, which would grow the biofuel feed stocks that are processed into biofuels.

### Suppliers Serving Local Industries

Other potential business attraction opportunities could come from the suppliers, vendors, and service providers in the target industries’ supply chains that produce intermediate products or materials for use by local industries. Supply chain management and optimization is becoming increasingly important to companies looking to gain a competitive advantage. Since the mid-1960s, U.S. companies have been slicing up their supply chains in search of low-cost suppliers offshore. Today, sophisticated companies are switching from low-cost country sourcing to best-value country sourcing and this can often mean manufacturing in the U.S.

Today, many factories are really just assembly operations, with much of the actual manufacturing done by suppliers. When deciding where to locate an assembly

plant, proximity to suppliers is an important factor. The location of a company's suppliers and vendors is of growing concern for a number of reasons including the need for:

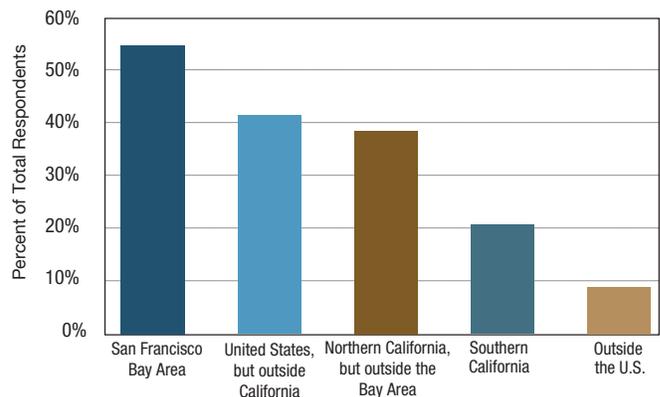
- speed-to-market and flexibility to respond to dynamic market demands especially for products with high fashion content;
- faster product development due to shorter product life cycles; and
- smaller production runs

When asked where their major vendors/suppliers were located, approximately 55% of the manufacturers in the Northern Waterfront responded that they sourced some or all of their inputs from suppliers located in the Bay Area (see *Figure 14*). Less than 10% used suppliers located outside the U.S. This indicates that opportunities may exist to capture more vendors in the manufacturing supply chain locally within the Northern Waterfront.

Currently, most manufacturers in the Northern Waterfront source their inputs from suppliers located throughout the Bay Area and Northern California. Strategies to highlight local supply chain opportunities should be a priority. Many suppliers do not necessarily need to operate in close proximity to their customers, but represents a potential opportunity for import substitution from existing companies whose business operations require a carefully orchestrated flow of inputs to their production processes enabling them to expand their purchasing from local suppliers. Industries in a supply chain can be identified by conducting an economic analysis of the Northern Waterfront economy using an input-output model based on a combination of inputs of locally supplied commodities and imported products required by existing firms to conduct business. Examples of potential suppliers in selected subsectors include, but are not limited to, the following:

**Petroleum Refining** – The primary supplier sectors include crude oil, energy, industrial gases, chemicals, wholesale distributors, construction, trucking, rail, pipeline transportation, and professional and technical services.

**Figure 14: Where are the Major Vendors/Suppliers in Your Supply Chain Located?**



Source: Northern Waterfront Employer Survey Q3 2013

**Diversified Manufacturing** – This cluster is comprised of primary metal manufacturers, chemical manufacturing, fabricated metal products, machinery manufacturing, nonmetallic mineral products, electronics, electrical equipment, and transportation equipment. Suppliers include energy, distributors, truck and rail transportation, professional services, and management services.

**Clean Technology** – Suppliers include fabricated metals, other machinery manufacturers, plastic products, specialized maintenance and installation contractors, and recycled materials. Other sectors include utilities, wholesale trade, professional and technical services, and electronic components.

**Food and Beverage Processing** – The food processing cluster consists of enterprises whose principal activities are the growing, harvesting, processing, and/or distribution of food. Suppliers include agriculture, distributors, packagers, breweries, wineries, professional services, wholesale trade, and companies that provide equipment, support, and products used in processing and packaging.

**Life Sciences** – This cluster is comprised of medical devices, research organizations, testing labs, equipment and lab suppliers, and professional and technical services.

## Capturing Emerging Opportunities

Critical factors for capturing emerging market opportunities involve more than just the availability of appropriately zoned industrial parcels, competitively priced real estate, or an expedited permit process. Local governments should act expeditiously and in a collaborative manner to address the challenges faced by the Northern Waterfront. In order to make the Northern Waterfront a competitive location that is attractive to manufacturing firms, local governments will need to make investments in critical transportation and utility infrastructure, install advanced communication infrastructure, develop a skilled workforce with advanced manufacturing skills, update zoning codes to protect industrial lands and encourage the development of advanced manufacturing facilities and industrial parks, streamline the issuance of building permits and project approvals, establish loan programs and investment incentives, support the development of targeted industry clusters, and actively market the Northern Waterfront as a location for advanced manufacturing.

## Factors Influencing Industrial Attraction<sup>11</sup>

The criteria companies use when selecting sites for manufacturing and cargo handling activities are changing to reflect the new economic normal that focuses on the operational requirements and location costs of doing business. The most recent national site selection survey (see *Figure A8* in the Appendix) conducted by *Area Development Magazine*, found that a third of the companies with relocation plans cite high taxes and excessive government regulations as their reasons for moving, while a quarter need to be in closer proximity to suppliers or markets served, and about a fifth are concerned with rising healthcare costs and the quality of life at their present locations. Only 3% of the respondents expect to relocate a domestic operation from offshore or a foreign facility back to the U.S.

<sup>11</sup> Area Development Magazine, “27th Annual Survey of Corporate Executives: Changing Site Selection Priorities”, found online at: [www.areadevelopment.com/Corporate-Consultants-Survey-Results/Q1-2013/27th-Corporate-Executive-RE-survey-results-37376241.shtml](http://www.areadevelopment.com/Corporate-Consultants-Survey-Results/Q1-2013/27th-Corporate-Executive-RE-survey-results-37376241.shtml), August 17, 2013

Historically, labor costs and highway accessibility are the top ranked factors in industrial site selection. The 2012 annual survey found no exception. Labor costs were ranked first among the site selection factors, considered “very important” or “important” by almost 91% of the respondents, closely followed by highway accessibility, with a combined importance rating of 90%.

Availability of advanced information and communication technology (ICT) infrastructure took a major jump, moving from 11th to 4th place between 2006 and 2012. The availability of buildings also moved up in ranking, while access to a maritime port or railroad service, which have both been added since 2006, are ranked near the bottom of the list of priorities. This may be due, in part, to the type of companies responding to the survey. Occupancy and construction costs maintained fifth place ranking among the site selection factors.

The corporate tax ranking has remained the same over the past six plus years, while financial incentives dropped in ranking. The drop may be due to the fact that companies are realizing that incentives can’t make up for high labor costs, poor highway access, a lack of skilled labor, or high energy or occupancy costs. In other words, financial incentives cannot make a bad location good.

The need for skilled labor has increased in the rankings while the availability of unskilled labor has dropped in priority. About two-fifths of the respondents said the unskilled portion of the workforce lack basic reading and math skills. Most importantly, these workers are lacking the more advanced skills that the manufacturers require, such as advanced welding and machine tool programming. As a result, the availability of unskilled labor showed the largest percentage decrease in importance, dropping to 25th place and is now considered “very important or important” by fewer than half of the survey respondents. Proximity to technical college/training programs are considered “very important” or “important” by more than half of the respondents, although these two requirements are still ranked toward the bottom of the list among the site selection factors. This may be due to the lack of industry driven certification programs.

Sustainable development was ranked by 68% of respondents as being more important to their company now than in the past, with three-quarters of the companies making energy-saving modifications to their facilities, while two-thirds are recycling or re-using waste products. Nearly 70% of the respondents said that while sustainability is more important now than in the past, two-thirds noted that communities are not offering specific incentives for green initiatives. If local policy-makers were to offer such incentives, it could be an opportunity for the Northern Waterfront to attract businesses concerned about sustainability.

Communities that are successful in attracting and growing their manufacturing sector have addressed the key factors driving industrial site location decisions.

# Challenges Ahead

## Global Economic Growth

**G**LOBAL TRENDS SHOW most economies are slowly recovering from the recession. The Conference Board's Global Economic Outlook<sup>12</sup> forecasts that long-term global economic growth is expected to slow down driven largely by structural transformations in emerging economies as they mature from rapid, investment-intensive growth to a more balanced model, bringing down global growth despite the recovery expected in advanced economies after 2013. Projections for growth of the world economy through 2025 indicate that global GDP will slow to around 3% annually.

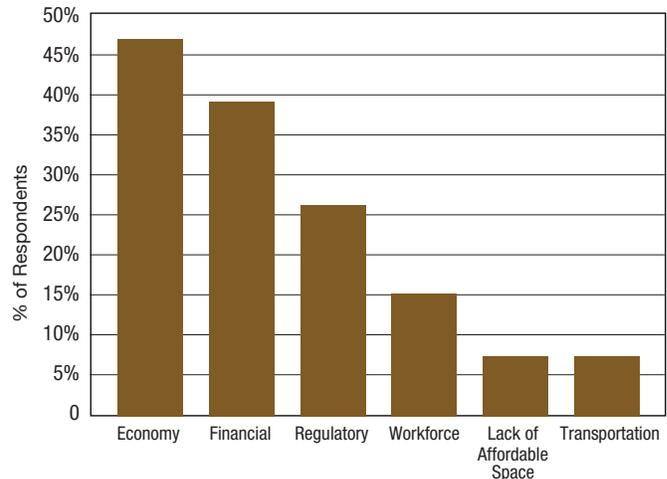
The Bureau of Labor Statistics projects<sup>13</sup> that manufacturing employment nationally will decline by 0.1% annually between 2010 and 2020. Driving some of the job loss will be an increase in the volume of manufactured goods that are imported, as well as increased productivity gains. However, within the manufacturing sector, several subsectors are projected to increase employment, including construction materials, while other subsectors such as technology, chemicals, petroleum refining, and electrical equipment are expected to show a loss of employment. Although employment is projected to decline for certain manufacturing subsectors, output is projected to increase in many of these subsectors due to improved productivity. Within the manufacturing sector, 32 out of 77 industries are projected to increase employment.

The overall output for the manufacturing sector is expected to increase from \$4.4 trillion to \$5.7 trillion due to increased productivity, a 2.8% annual increase in production, higher than the pre-recession level of output. Regions with the right mix of industries can

<sup>12</sup> The Conference Board, Global Economic Outlook, found at <http://www.conference-board.org/data/globaloutlook.cfm>, October 2013

<sup>13</sup> Bureau of Labor Statistics, "Employment Outlook 2010–2020: Industry employment and output projections to 2020", Monthly Labor Review, January 2012

Figure 15: Significant Barriers to Growth



expect employment growth in the manufacturing sector over the near and long term, especially those industries that export to external markets.

According to the survey of local manufacturers in the Northern Waterfront conducted as part of this study, the biggest barrier to expansion for local firms is the economy followed by financial constraints (see **Figure 15**). Most of the firms need some type of external assistance with financing and/or marketing in order to grow. When asked “*what are the two biggest issues facing your business,*” the overwhelming response was “*adjusting to current economic conditions and changes following the recession.*”

## Development Constraints

An analysis of the Northern Waterfront's Strengths, Weaknesses, Opportunities, and Threats (SWOT) was conducted by the consultant team to evaluate the opportunities and challenges the region faces with regards to industrial development. A matrix summarizing the SWOT analysis is located in the Appendix (see **Table A2**). What follows is a description of the most pressing impediments.

**Available Supply of Skilled Workers:** Labor availability and costs consistently rank near the top as critical factors in industrial site selection decisions. The shortage of skilled workers nationally is a pressing problem for manufacturers, and there is a renewed interest in developing training programs that respond to industry needs. Local manufacturing firms have expressed similar concerns. When asked *“what percentage of the candidates who apply for your open positions meet your minimum requirements,”* most employers expressed concern about being able to find qualified candidates. Basic skills and a good work ethic were missing in most candidates, as well as specific skills and experience. The Contra Costa Workforce Development Board recently conducted a study of the Advanced Manufacturing sector’s workforce needs and prepared a strategy to address the hiring and training needs of skilled workers for In-Demand and Priority Occupations. The Process Technology Program (P-TEC) at Los Medanos College, which was developed in response to requests from local chemical and refining industries, is an example of how educational institutions and workforce training organizations can support the manufacturing sector’s needs for a skilled workforce in the Northern Waterfront.

**Ability to Move Goods Efficiently and Cost-effectively:** Transportation costs remain an important consideration in a company’s location strategy. Businesses look at where they can procure raw materials and other inputs cost-effectively when determining the best location for expansion or establishment of new facilities. Proximity to their existing customer base and major markets are also key considerations in where to locate. How transportation costs change based on proximity to suppliers, warehouses, and customers is an important factor. The ability to transport finished goods and raw materials efficiently and cost effectively is an important consideration in the location of industrial facilities.

While the Northern Waterfront is fortunate to have access to goods movement infrastructure including water, rail, road, and pipeline networks there are some challenges that need to be addressed. A Reconnaissance Survey of transportation infrastructure and operational

issues was conducted by Cambridge Systematics on September 4, 2013 to identify key transportation issues affecting the Northern Waterfront. Surface transportation issues that were investigated include the quality of road surfaces, curves, vertical clearances, overhead obstructions, capacity, and access.

SR-4 is the primary transportation corridor that connects the Northern Waterfront to the interstate highway system, but SR-4 and the neighboring highways are highly congested, which impedes freight mobility. Road bottlenecks and hazardous conditions are present and stretches of SR-4 are in disrepair. Freight stakeholders have reported that SR-4 seems to be under a constant state of construction and freight velocity is compromised. If more businesses locate in the Northern Waterfront, congestion will increase in the absence of sufficient investment in highway capacity improvements.

Currently, the SR-4 Bypass in East Contra Costa is more of a local road that connects with Vasco Road and the Byron Highway. Improvements are needed to connect SR-4 to the I-580/I-205 corridor. A feasibility study (TriLink SR-239) is currently being completed for a transportation facility that would connect SR-4 near Brentwood to the Interstate 580/205 corridor near Tracy opening up a direct route to Interstate 5 and the Central Valley.

A number of road infrastructure projects are either planned or underway that will improve goods movement for companies operating in the Northern Waterfront. For example, the Regional Transportation Improvement Plan (RTIP) calls for several improvements to the I-680/SR-4 interchange including construction of general traffic and high occupancy vehicle (HOV) flyover ramp connections and widening of SR-4 between Morello and SR-242). The RTIP also calls for improvements to the I-680/SR-4 interchange, which includes connecting southbound I-680 to eastbound SR-4, connecting westbound SR-4 to northbound I-680, and constructing high occupancy vehicle (HOV) flyover ramps from westbound SR-4 to I-680 southbound from I-680 northbound to eastbound SR-4. If planned road projects do not move forward in a timely manner or not at all,

freight mobility will be further compromised, making the Northern Waterfront a less desirable location for industry.

Maritime shipping requires maintaining adequate depths for ships to navigate the channel through the Carquinez Straits and Suisun Bay. To remain competitive, channels and berthing areas will require periodic dredging to maintain adequate depths. A Channel Dredging Plan for Suisun Bay prepared by the U.S. Army Corps of Engineers is shown in *Figure A1* in the Appendix. Additional information on dredging projects can be found in *Memorandum 1*.

Some of the manufacturers that are considering locating or expanding in the Northern Waterfront will likely have requirements for rail transportation of finished products or raw materials. Although two Class 1 rail systems are located along the Northern Waterfront, it is unknown whether and under what conditions the railroads will offer access and service to these businesses.

**Availability and Capacity of Utility Infrastructure:**

Industrial areas in the Northern Waterfront are served by a combination of city services, special districts, and public and private utilities. Having critical utilities, principally electricity, water, sewer, natural gas, and advanced telecommunications in place or that can be quickly delivered to a site with the capacity to meet industry's needs, creates a competitive edge in successfully attracting new manufacturers that have short timeframes to be up and running. Parcels requiring off-site utility extensions may be considered, but are less competitive. The quality and cost of utility services are also a factor in site selection. Survey respondents complained that the cost of utilities in the Northern Waterfront is too high and that utility companies are not cooperative. Coordination on a regional basis is needed to deliver needed utility infrastructure. Utility companies and special service districts should be encouraged to prepare master plans for needed infrastructure extensions and upgrades. Key utilities to be addressed include:

- **Electric Power:** PG&E provides gas and electric service to industrial customers in most communities within the Northern Waterfront. Several survey respondents complained about occasional power outages affecting their business. However, it is not known whether these power outages are due to inadequate system capacity, weather conditions, or other causes. PG&E recently announced that it will soon begin offering a competitive new electric rate aimed at promoting economic development by making it possible for eligible employers to keep, expand, or launch new operations in California rather than leave the state. The new rate, approved by the California Public Utilities Commission targets companies with power loads of at least 200 kilowatts that would otherwise locate operations out-of-state. The rate would provide a 12 percent rate reduction for five years for those who avow that they need it to stay, site new operations, or expand existing facilities in California.
  - **Water:** Industrial sites must be served by a reliable water supply adequate to meet industrial needs. Nearly every industrial plant uses water as part of its operation and manufacturing process. Industrial water is needed for cooling towers, steam production, industrial processes, wash water applications, product manufacturing, landscape irrigation, sanitation needs, and fire suppression systems. Individual sites that are inadequately or currently not served are not competitive locations. While distribution lines may be nearby, necessary lateral connections may not serve all industrial parcels. Line extensions and connection fees are added costs that will negatively impact expanding or relocating firms.
- Industrial water users are also concerned about water quality, since it can cause problems for manufacturing processes. On a positive note, water agencies serving the Northern Waterfront provide a relatively good quality of water that meets industry's current needs.

- Sewage Treatment:** Wastewater collection, treatment, and disposal are provided by a combination of five special districts - Rodeo Sanitary District, Crockett Community Services District, Central Contra Costa Sanitary District (CCCSD), Delta Diablo Sanitation District, and Ironhouse Sanitary District - and six cities. Treatment and disposal is typically performed by one of the special districts while cities are responsible for collection. Some of the major industrial facilities in the Northern Waterfront have their own on-site wastewater treatment facilities. For example, Rodeo Sanitary District has no industrial accounts so Phillips 66 Refinery operates its own private wastewater system. Shell Martinez Refinery in Martinez has its own on-site waste water treatment facility. The CCSD owns a small share of the secondary wastewater treatment plant in Crockett. The C&H Sugar Company is the primary owner and designated operator of the plant. C&H contracts with an outside company to maintain and operate the plant and disposal facilities. Having to install an individual treatment facility and obtain a discharge permit could delay a new project.
- Recycled Water:** While recycled water is available it may not be useable for industrial purposes without more advanced treatment. Approximately 28% of the survey respondents stated that they would use advanced treated recycled water if available. Delta Diablo Sanitation District is planning to expand its recycled water treatment capacity and make advanced treated recycled water available to more industrial customers. Central Contra Costa Sanitary District is exploring options to provide industrial recycled water to local petroleum refineries for cooling water purposes. Although not located in the Northern Waterfront Study Area, East Bay Municipal Utility District's North Richmond Water Reclamation Plant produces recycled water for industrial application. With a design capacity of 5.4 million gallons per day (mgd), it is one of the larger industrial cooling water reuse projects in the nation. Chevron uses the recycled water in its boilers to generate steam to operate facilities and equipment used to manufacture gasoline, jet fuel, diesel and lubricants. Only extremely high-purity water can be used in the manufacturing process.
- Advanced Telecommunications:** Advanced telecommunications infrastructure is increasingly more important as high-speed communications are becoming a requirement for reliable and efficient handling of goods movement and logistics.<sup>14</sup> Survey respondents commented that high-speed broadband communication lines that can transmit data at T-1 speeds (1.544 megabits per second) or faster are not widely available throughout the Northern Waterfront. This may be a limiting factor for some areas and industries. Competition comes from communities like San Leandro that unanimously approved a license agreement allowing installation of a fiber optic loop through several areas of the City using existing conduit. The installation known as "Lit San Leandro" offers an opportunity to revolutionize San Leandro's infrastructure, positioning the City to be a major player in the high-tech and clean-tech economies. Businesses connecting to the fiber loop enjoy internet speeds of up to ten gigabits per second, roughly 2,000 times the average U.S. connection speed.

**Protection of Industrial Lands:** Very few large land parcels zoned for heavy industrial use with rail and water access exist in the Bay Area. Various studies have documented the loss of industrial lands in other parts of the Bay Area, creating an opportunity for the Northern Waterfront to preserve and modernize its industrial real estate in order to have development sites available for relocating and expanding industries.

Land use conflicts occur when residential projects and public facilities such as schools and hospitals are located adjacent to or in proximity to industrial areas and manufacturing facilities. Conflicts arise due to truck traffic, noise, glare, noxious odors, and other environmental issues, which discourages industrial development of industrial zoned parcels. One manufacturer surveyed complained about the conflict with a proposed housing project adjacent to his property and a public school located on the other side. Industrial zoned parcels need to be protected from conversion to other uses and the development of adjacent or nearby parcels which create a conflicting use.

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<sup>14</sup> Hesse, Markus, Access, "Location Matters", Fall 2002

**Business Climate and Regulatory Environment:** Public policy can create both opportunities and constraints for industrial development. A survey of manufacturing firms in the Northern Waterfront revealed concern about the increasing amount of regulatory compliance issues and the timeframe required for approval. One firm responded that unless changes are made to welcome small business, they won't survive. There was also mention of the need for local government to focus on the benefits of maintaining a healthy industrial waterfront.

According to a survey by the California Manufacturing and Technology Association, state policies are the primary reasons why businesses decide to locate or expand operations outside of California. These factors include tax rates, costs of regulations, infrastructure, and access to skilled workers at reasonable cost.<sup>15</sup> According to the CMTA survey, manufacturing companies do not stay in California because the state has a great business climate or ranked highly in important site location factors. The majority of companies that stayed did so because the state provided close proximity to customers and suppliers or they were a small businesses whose owners made a lifestyle choice to stay in-state. The key take-away from the CMTA survey is that California is not a competitive place for a manufacturing company. Costs, regulations, permitting delays, a lack of incentives, high labor costs, a high tax rate, and other factors make it very difficult for manufacturers to do business. Streamlining the regulatory and permitting processes and removing financial disincentives on capital investment, among other reforms, could make California and the Northern Waterfront a more attractive destination for growing companies. While California does not rank highly on most business friendly surveys, it continues to attract manufacturers looking to expand, ranking 16th in the nation in terms of the number of companies choosing to relocate.

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<sup>15</sup> California Manufacturing and Technology Association, "2012 Business Expansion and New Site Survey: Why Companies Do and Don't Choose California", June 2012



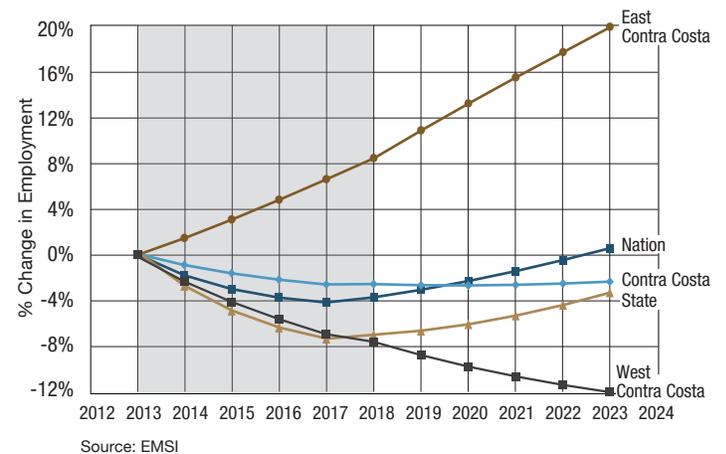
# Development Outlook for the Northern Waterfront

## Regional Growth Projections

**E**MPLOYMENT PROJECTIONS BY the California Employment Development Department show manufacturing employment in the East Bay (Alameda and Contra Costa Counties) growing by 4.6% over the ten year time period from 2010 to 2020. The manufacturing sector would add 3,700 net new jobs during this time period, primarily due to the growth in durable goods such as computers and electronic equipment. Non-durable goods, including petroleum and chemicals are expected to decline. Goods movement sectors are also expected to show positive job growth with the Transportation and Warehousing Sector adding 5,200 jobs (an increase of 16.5%) and Wholesale Trade increasing by 8.4% with the addition of 3,500 net new jobs. Much of this future growth is being driven by the high tech sector in southern Alameda County and logistics activity adjacent to the Port of Oakland.

Contrary to the East Bay's projected growth, the number of manufacturing jobs in the Northern Waterfront is expected to decline similar to that of Contra Costa County primarily due to its existing mix of industries. Forecasts of manufacturing employment by Economic Modeling Specialists International (EMSI) over the next five years, from 2013 to 2018, show that the manufacturing sector in the Northern Waterfront and Contra Costa County will lose jobs, but not at the same rate as the nation or state (see *Figure 16*). From 2018 through 2023, the loss of manufacturing jobs should begin to stabilize. East Contra Costa is expected to show positive employment growth, while manufacturing jobs in west Contra Costa is projected to decline and manufacturing employment in central Contra Costa will remain relatively stable. Five manufacturing subsectors are forecasted to grow including Food Products, Beverage Products, Primary Metals, Wood Products,

**Figure 16: Projected Manufacturing Job Growth 2013-2023**



and Machinery. While national industry trends show a decline in these subsectors (except wood products), local firms are projected to grow because of local competitive advantages. Regional competitiveness factors like technology innovation, a skilled workforce, industry clusters, growing markets, or specific conditions in the region, such as the closing or opening of a new factory, can explain how much of the change in a given industry's growth can be attributed to unique conditions within a region that cannot be explained by national industry trends or growth of the economy as a whole.

## Growth of Advanced Manufacturing Firms

While manufacturing employment in the Northern Waterfront and Contra Costa County is projected to decline, most advanced manufacturing firms, when responding to a recent workforce survey, expressed plans to grow their businesses with an average annual net job growth rate of 2.8% (see *Table 7*). Companies in eight out of 14 manufacturing subsectors plan on

**TABLE 7: Employment Growth Plans in County's Advanced Manufacturing Subsectors 2013-2016**

Sub-Sector	2013 Employment	2016 Employment	Net New Job	% Change
Petroleum Refining and Products	3,460	3,497	37	1.1%
Digital and Electronic Devices and Components	1,448	1,932	484	33.4%
Metal Processing and Fabrication	1,373	1,504	131	9.5%
Life Sciences, including Pharmaceuticals, Biotechnology, Medical Devices and Equipment	921	909	-12	-1.3%
Food & Beverage Processing	875	845	-30	-3.4%
Polymers & Coatings	505	600	95	18.8%
Printing	318	365	47	14.8%
Industrial, Agriculture, and Household Chemicals	298	281	-17	-5.7%
Machinery	166	180	14	8.4%
Electrical Equipment and Appliances	73	125	52	71.2%
Furniture	59	64	5	8.5%
<b>Total</b>	<b>9,496</b>	<b>10,303</b>	<b>804</b>	<b>8.5%</b>

Source: Workforce Survey of Advanced Manufacturing Firms in Contra Costa County, December 2012-February 2013

employment growth that will be above the average for the county's manufacturing sector. The subsectors that are expected to grow over the next three years include Electrical Equipment and Appliances (71.2%), Digital and Electronic Devices and Components (33.4%), Polymers and Coatings (18.8%), Printing (14.8%), Metal Processing and Fabrication (9.5%), Furniture (8.5%), Machinery (8.4%), and Petroleum Refining (1.1%). Many of the advanced manufacturing firms in these subsectors are located in the Northern Waterfront.

## Local Industry Performance

Although the County's manufacturing sector is expected to lose manufacturing jobs over the next five years (see **Table 8**), it will outperform the manufacturing sector at the national level and not experience the same rate of loss as the national economy. In fact, several local manufacturing subsectors are expected to grow at a faster pace than their national counterparts,

further strengthening the regional concentration of employment in those subsectors. Beginning around 2020 the county's manufacturing sector is not expected to perform as well as the national economy, primarily due to faster job growth in national manufacturing subsectors that do not have a strong presence or are not currently present in Contra Costa County. If the local manufacturing sector grew at the same rate as the national economy, Contra Costa County would add new manufacturing jobs. Unfortunately the county's manufacturing sector is expected to follow national industry trends and show an overall decline in manufacturing employment due to its mix of industries. Six industries are projected to show positive job growth due to some local competitive advantage despite a decline in that industry at the national level.

A Shift-Share Analysis for the Northern Waterfront was conducted (see **Table 9**) to determine whether growth (or decline) in local manufacturing employment can be

**TABLE 8: Projected Growth of Manufacturing Industries Along Northern Waterfront**

(DATA BASED ON COMMUNITY ZIP CODE BOUNDARIES)

NAICS Code	Description	2013 Jobs	2018 Jobs	Change	% Change	2013 Location Quotient
3241	Petroleum and Coal Products	3,137	2,996	-141	-4%	39.35
3311	Iron and Steel Mills and Ferroalloy Mfg	760	1,070	310	41%	11.85
3274	Lime and Gypsum Product	63	43	-20	-32%	6.36
3343	Audio and Video Equipment	50	65	15	30%	3.53
3379	Other Furniture Related Products	76	57	-19	-25%	3.03
3115	Dairy Products	199	273	74	37%	2.11
3259	Other Chemical Product and Preparation	114	125	11	10%	1.93
3391	Medical Equipment and Supplies	419	436	17	4%	1.92
3113	Sugar and Confectionery Products	84	102	18	21%	1.79
3345	Navigational, Measuring, Electromedical, & Control Instruments	480	253	-227	-47%	1.73
3342	Communications Equipment	126	95	-31	-25%	1.66
3251	Basic Chemicals	153	<10	0	--	1.49
3255	Paint, Coating, and Adhesive Manufacturing	60	33	-27	-45%	1.44
3279	Other Nonmetallic Mineral Product	68	66	-2	-3%	1.37
3359	Other Electrical Equipment and Components	118	99	-19	-16%	1.34
3254	Pharmaceutical and Medicine	225	101	-124	-55%	1.16
3273	Cement and Concrete Products	94	103	9	10%	0.81
3312	Steel Product Manufacturing from Purchased Steel	33	42	9	27%	0.78
3119	Other Food Manufacturing	91	143	52	57%	0.72
3332	Industrial Machinery	46	46	0	0%	0.63
3323	Architectural and Structural Metals	118	99	-19	-16%	0.48
3152	Cut and Sew Apparel	34	21	-13	-38%	0.42
3327	Machine Shops; Turned Products; Screws, Nuts & Bolts	105	117	12	11%	0.40
3329	Other Fabricated Metal Products	77	82	5	6%	0.40
3231	Printing and Related Support Activities	127	112	-15	-12%	0.40
3399	Other Miscellaneous Manufacturing	70	82	12	17%	0.38
3366	Ship and Boat Building	29	34	5	17%	0.31
3321	Forging and Stamping	18	12	-6	-33%	0.25
3112	Grain and Oilseed Milling	10	15	5	50%	0.24
3339	Other General Purpose Machinery	40	35	-5	-13%	0.23
3219	Other Wood Products	31	39	8	26%	0.22
3372	Office Furniture (including Fixtures)	15	15	0	0%	0.22

(CONTINUED NEXT PAGE)

**TABLE 8 (CONTINUED): Projected Growth of Manufacturing Industries Along Northern Waterfront**

NAICS Code	Description	2013 Jobs	2018 Jobs	Change	% Change	2013 Location Quotient
3335	Metalworking Machinery	26	26	0	0%	0.21
3222	Converted Paper Products	26	<10	0	--	0.14
3363	Motor Vehicle Parts	47	49	2	4%	0.13
3315	Foundries	11	<10	0	--	0.13
3118	Bakeries and Tortilla	24	26	2	8%	0.12
3121	Beverage Mfg	15	21	6	40%	0.11
3344	Semiconductor & Other Electronic Components	27	39	12	44%	0.10
3371	Household/Institutional Furniture & Kitchen Cabinets	15	20	5	33%	0.10
3261	Plastic Products	15	15	0	--	0.04
3133	Textile and Fabric Finishing and Fabric Coating Mills	<10	<10	0	--	--
3149	Other Textile Product Mills	<10	<10	0	--	--
3211	Sawmills and Wood Preservation	<10	0	0	--	--
3271	Clay Product and Refractory Mfg	<10	<10	0	--	--
3272	Glass and Glass Products	<10	<10	0	--	--
3324	Boiler, Tank, and Shipping Containers	<10	<10	0	--	--
3326	Spring and Wire Products	<10	<10	0	--	--
3328	Coating, Engraving, Heat Treating, & Allied Activities	<10	0	0	--	--
3331	Agriculture, Construction, and Mining Machinery	<10	<10	0	--	--
3333	Commercial and Service Industry Machinery	<10	<10	0	--	--
3334	HVAC and Commercial Refrigeration Equipment	<10	<10	0	--	--
3341	Computer and Peripheral Equipment	<10	<10	0	--	--
3353	Electrical Equipment	<10	<10	0	--	--
3362	Motor Vehicle Body and Trailer Mfg	<10	0	0	--	--
	<b>Total</b>	<b>7,3256</b>	<b>7,057</b>	<b>-268</b>	<b>-3.7%</b>	<b>0.87</b>

Source: QCEW Employees - EMSI 2013.3 Class of Worker (Zip Code boundaries for communities along the Northern Waterfront were obtained online at <http://maps.huge.info/zip.htm>, October 2013)

**TABLE 9: Shift Share Analysis of Projected Manufacturing Sector Job Growth in Communities Along the Northern Waterfront**

NAICS Code	Description	2013 Jobs	2018 Jobs	Industry Mix	National Growth	Expected Change	Competitive Effect	Change	% Change
311	Food Processing	408	560	-20	25	5	148	152	37%
312	Beverage and Tobacco Products	15	21	-1	1	0	7	6	40%
313	Textile Mills	<10	<10	-2	0	-2	1	--	--
314	Textile Product Mills	<10	<10	0	0	0	0	--	--
315	Apparel Manufacturing	34	21	-15	2	-13	0	-13	-38%
316	Leather and Allied Products	0	0	0	0	0	0	0	0%
321	Wood Products	32	39	-4	2	-2	9	7	22%
322	Paper Manufacturing	26	<10	-4	2	-2	-17	--	--
323	Printing and Related Support Activities	127	112	-24	8	-16	2	-15	-12%
324	Petroleum and Coal Products	3,137	2,996	-240	190	-50	-92	-141	-4%
325	Chemical	553	266	-47	34	-13	-274	-287	-52%
326	Plastics and Rubber Products	15	15	-1	1	0	0	0	0%
327	Nonmetallic Mineral Product	233	216	-21	14	-7	-11	-17	-7%
331	Primary Metal	804	1,115	-73	49	-24	336	311	39%
332	Fabricated Metal Product	324	315	-16	20	4	-12	-9	-3%
333	Machinery	130	120	-9	8	-1	-8	-10	-8%
334	Computer and Electronic Product	683	453	-80	41	-39	-191	-230	-34%
335	Electrical Equipment, Appliance, and Component	127	102	-14	8	-6	-18	-25	-20%
336	Transportation Equipment	78	83	-7	5	-2	8	5	6%
337	Furniture and Related Product	106	92	-17	6	-11	-3	-14	-13%
339	Miscellaneous Manufacturing	490	518	-42	30	-12	42	28	6%
<b>Total</b>		<b>7,325</b>	<b>7,057</b>	<b>-639</b>	<b>444</b>	<b>-195</b>	<b>-73</b>	<b>-268</b>	<b>-3.7%</b>

Source: QCEW Employees - EMSI 2013.3 Class of Worker

attributable to growth of the national economy, overall industry trends nationally, or some local condition or competitive advantage. The six manufacturing subsectors that are expected to show positive job growth despite a decline in those subsectors nationally are food processing, beverage products, wood products, primary metals, transportation equipment, and miscellaneous manufacturing (primarily medical equipment and supplies).

A Shift-Share Analysis identifies a region's most competitive industries by comparing employment changes in each industry of the local economy to employment changes in the same sector of the national economy. When employment in a local industry grows at a faster pace (or declines less) than its counterpart nationally, a shift occurs in the proportion of employment captured by that industry locally, changing the region's competitive position. As a result, that industry would have a larger share of the local economy than its counterpart would have of the national economy.

## Near Term Development Outlook for the Northern Waterfront (5 to 10 Years)

Given current economic trends, the industrial development outlook for the Northern Waterfront over the near term looks encouraging, barring any major global economic downturn. The rate of job loss appears to be dramatically slowing from its historical norm over the past several decades. Projections by EMSI show a nominal loss of manufacturing jobs over the next five years between 2013 and 2018 as depicted in Table 8. The projected job growth/loss is shown by industry (at the 4-digit NAICS code level ranked by location quotient from the highest to the lowest). Although the geographic area covered by the projections includes zip code geographies that extend beyond the boundaries of the Northern Waterfront study area, the projections are still a good indicator of which industries are expected to grow and their relative employment concentrations. Several industries show competitive strength based

on location quotients in excess of 1.5 or higher and 48% of the industries show positive job growth. The manufacturing sector along the Northern Waterfront is also projected to outperform the nation and state with a lower rate of job loss due to the local mix of industries.

A recent survey of manufacturing firms in the Northern Waterfront indicates that the projected decline in employment over the next five to ten years may not be reflective of current conditions. Based on responses to a third quarter 2013 employer survey conducted as part of this study, 45% of the manufacturing firms in the Northern Waterfront stated that they plan to add employees over the next three to five years. The responses are similar to the earlier survey of advanced manufacturing firms conducted by the Contra Costa Workforce Development Board last year. Assuming that most companies, including small and medium sized firms, adopt advanced manufacturing techniques and grow at the same rate as the advanced manufacturing firms identified in **Table 7**, the Northern Waterfront could expect a net gain of 327 to 563 new jobs over the next five years from expansion of existing firms, instead of a net loss of 268 jobs. Though this may not seem to be a significant increase, it does represent a reversal of the historical trend, which can be amplified if additional companies locate in the Northern Waterfront.

In general, the outlook for industrial development along the Northern Waterfront in the near term looks encouraging given emerging market trends and the potential growth and expansion of existing industries, especially advanced manufacturing firms. Additional opportunities for job growth as a result of business attraction programs also exist including the:

- a. Attraction and capture of a greater percentage of vendors/suppliers in the existing supply chains of local companies;
- b. Attraction of new emerging industries, especially of companies that are established in the region as a result of technology developed by Bay Area companies and research labs that would like to keep their manufacturing operations in proximity to their research and product development facilities.

Genentech's Vacaville manufacturing facility is one example of a Bay Area company locating its manufacturing facilities near its R&D center;

- c. Expansion of the manufacturing sector in the Northern Waterfront as a result of the resurgence and reshoring of manufacturing jobs to the U.S., assuming this emerging trend develops into a broader mainstream opportunity. Apple's decision to move some production of Macintosh computers back to the U.S. from China is an example of American companies reshoring manufacturing jobs, and;
- d. Expansion of domestic trade linkages with California's Central Valley, especially with the food processing industry or feed stocks for biofuels.

Realization of these opportunities goes beyond current employment projections and will require public policy action by local governments to develop and market the Northern Waterfront as a competitive location for manufacturing and goods movement industries along with needed infrastructure investments. The window of opportunity for realizing these opportunities may extend beyond the near term, but will require concerted action by local governments in the near term.

## Long Term Development Outlook for the Northern Waterfront (10 to 20 Years)

Long-term economic forecasts show the U.S. economy growing slower than in prior decades. Projections by the White House, Congressional Budget Office (CBO), and others, forecast economic growth to be in the 2.2% to 2.5% range over the long term. The CBO<sup>16</sup> projected that from 2020 through 2035, GDP will grow at an average annual rate of 2.2%, while a survey of private economists suggests the economy will see an average annual growth rate of around 2.5%. Long-term employment growth, especially in mature industries, tends to be moderated by the growth of the domestic economy, unless it is a global company

<sup>16</sup> Congressional Budget Office, "The Long Term Budget Outlook", June 2009

exporting internationally, which in that case, the growth rate of the global economy (or at least those parts of the globe in which the firm operates) will be the limiting value. Individual industries may grow faster or slower than the overall economy because of various factors, such as the formation of new industries due to entrepreneurial activity, introduction of new products as a result of research and innovation, or government deregulation that leads to increased competition. In the manufacturing sector, employment tends to grow more slowly than output, reflecting improvements in productivity.

Due to intrinsic difficulties in forecasting long-term economic growth, the actual trends for the Northern Waterfront could differ from the outlook forecast because of changes over time in economic conditions, government actions, and other factors that are difficult to predict. Long-term economic forecasts become increasingly more uncertain the farther they extend into the future. Long-term structural changes in the global and regional economy, such as rising energy and labor costs in foreign countries with corresponding lower inflation rates in the U.S. would help make the Northern Waterfront a more competitive location.

## Major Factors Influencing Long-Term Manufacturing Job Growth

The long-term outlook for U.S. manufacturing employment is uncertain. There are two opposing arguments - one favoring a renaissance; the other a continuing decline based on historical trends. Those who forecast continued decline point out that there have been no structural changes that will lead to sustainable long-term growth. Major factors influencing the decline in manufacturing employment include a shift in demand away from manufactured goods to services, increased productivity, and growing foreign competition. Improvements in productivity due to investments in equipment and advanced manufacturing technologies and processes along with foreign competition will continue to be a moderating influence on job growth in the manufacturing sector over the long term.

Economists who project future growth in the manufacturing sector point to several factors which have led to the recent resurgence and reshoring of manufacturing jobs. One report<sup>17</sup> by PriceWaterhouseCoopers (PwC) examines some of the key factors that could drive a sustained manufacturing resurgence including increases in costs for labor in other countries, transportation, energy, and materials, as well as favorable changes in currency exchange rates, availability of skilled labor, tax code changes, innovation, and the adoption of advanced manufacturing processes that increase productivity. The report acknowledges that the U.S. manufacturing sector may be experiencing a cyclical recovery, but that structural changes are occurring in some areas that could extend the recovery beyond what might be expected during a typical economic upturn following a recession. The report argues that, should an increase in the relative competitiveness of American labor costs continue to improve, it will not be sufficient in itself to result in a domestic manufacturing resurgence. Instead, a host of other factors—particularly transportation and energy costs, and currency fluctuations—are more likely the most salient reasons U.S. companies will choose to produce closer to their major customer markets, which will result in the reshoring of some production back to the U.S. Such a shift most likely will lead to improved employment demand in the U.S. for both production and R&D jobs.

The PwC report also found that many manufacturers are increasingly reevaluating their strategies, such as the separation of R&D from production, and the need to manufacture abroad with importation of finished goods back to the U.S. in light of changing economic conditions. Depending on the industry, manufacturing firms may find considerable benefits in establishing regionalized supply chains and R&D facilities in the U.S. that would lead to reducing costs, shortening lead times, protecting intellectual property, and avoiding many of the risk factors of developing markets. Localizing production would also help reduce

<sup>17</sup> PriceWaterhouseCoopers, “A homecoming for US manufacturing?, Why a resurgence in US manufacturing may be the next big bet”, September 2012

supply chain disruptions due to natural disasters, political instability, transport disruptions, trade secret thefts, and other factors that cost American industrial manufacturers \$2.2 billion last year. However, bringing production back to the U.S. may not result in significant employment growth, as manufacturers continue to invest in equipment and adopt advanced manufacturing techniques that require fewer, but higher skilled workers.

## Projected Job Growth over the Long Term

As the economy continues to expand over the long term, manufacturing employment is also expected to grow, but not necessarily at the same rate. The Association of Bay Area Governments (ABAG) forecasts<sup>18</sup> a positive long-term outlook for manufacturing/wholesale employment in Contra Costa County. The combined sectors are projected to increase by 1.25% annually between 2025 and 2035. It is estimated that manufacturing employment alone will show a slightly slower average annual growth rate of 1.18% (see **Table 10**). Although there are no long-term projections of manufacturing employment for the Northern Waterfront, many of Contra Costa County’s major industries and much of its manufacturing employment is concentrated along the Northern Waterfront. Approximately 71% of the County’s manufacturing employment is located in communities along the Northern Waterfront and Richmond. Therefore, it is reasonable to assume that manufacturing employment in the Northern Waterfront will grow at a similar rate as the County.

## Potential Growth Sectors

A number of industries have the potential to positively impact industrial growth in the Northern Waterfront. Target industries include subsectors that are projected to grow over the near term (see **Table 11**) as well as the attraction of new emerging industries such as the production of advanced biofuels. Some of the new emerging industries are not adequately reflected in the data, but present opportunities nonetheless.

<sup>18</sup> Association of Bay Area Governments, “*Projections and Priorities 2009: Building Momentum*”, August 2009

**TABLE 10: Long-Term Manufacturing Employment Growth in Contra Costa County: 2010-2035**

	2010	2020	2025	2030	2035	2025-2035
Manufacturing/Wholesale	35,110	41,060	42,950	45,800	48,330	5,380
Change		2,840	1,890	2,850	2,530	7,270
Annual Growth Rate		1.40%	1.00%	1.40%	1.10%	1.25%
Manufacturing Sector Employment (estimate)	24,577	26,525	27,230	28,854	30,448	3,218
Annual Growth Rate		0.90%	0.53%	1.19%	1.10%	1.18%

Source: ABAG Projections 2009, calculations by Craft Consulting Group

Companies in existing large-scale industries including petroleum refining, sugar processing, power generation, chemical manufacturing, and primary metals, have the potential to serve as magnets that will attract related industries and suppliers within their supply chain. Companies in these core industries could serve as the anchor for development of several industry clusters in food and beverage processing, diversified manufacturing, clean technology, life sciences, and metal processing and fabrication. Industries within a supply chain can be identified using an Input-Output model of the local economy such as IMPLAN. Emerging industries can be identified using their six-digit North American Industry Classification System (NAICS) code and rate of employment growth over the past five to ten years.

Domestic trade linkages with the Central Valley is another potential growth opportunity with more agricultural products for export being processed in the Northern Waterfront or simply prepared for export, with chemical and organic fertilizers and other agricultural inputs being produced by local manufacturing plants and exported.

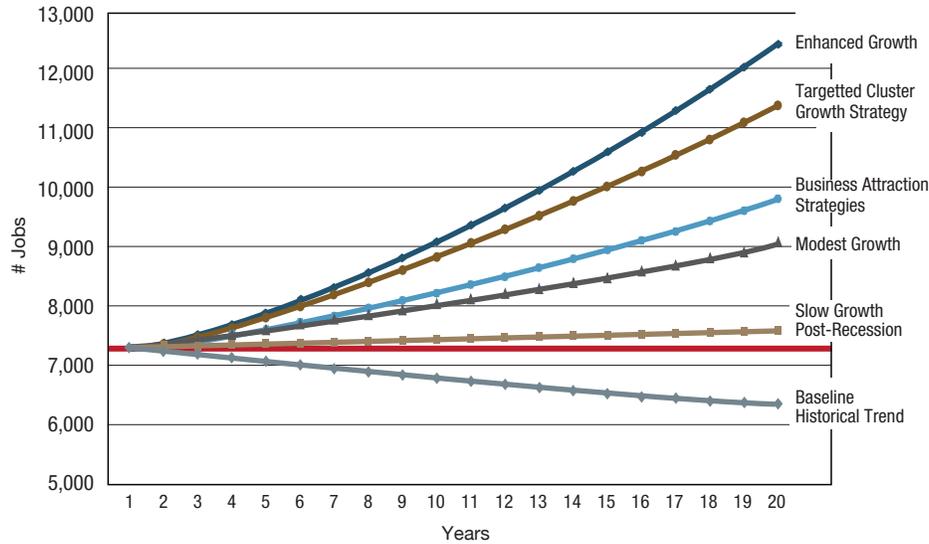
## Alternative Development Scenarios

The major trends described above present opportunities for economic development along the Northern Waterfront. To better define these opportunities, six Alternative Growth Scenarios were developed by the

Consultant Team, which represent a range of possible development outcomes based on a combination of historical trends, emerging market forces, and public policies that could influence the historical trend (baseline projection) in a positive manner (see *Figure 17*). The six alternative growth scenarios are described below with percentages representing the estimated compound annual growth rate (CAGR) of manufacturing jobs over the next 10 to 20 years.

- A. Baseline Projection - Continuation of Historical Trends (-0.7%):** Projections of historical trends indicate that manufacturing employment will continue to decline over the short and long-term (see *Table 11*). This baseline scenario reflects “business as usual” where nothing has changed as the global economy emerges from the recession with modest economic growth, productivity gains limit the need for a major expansion of the manufacturing workforce, and there continues to be limited investment in the industrial areas along the Northern Waterfront. Under this scenario a forecast (using EMSI data) of manufacturing employment in the Northern Waterfront shows a continuous loss of jobs averaging a negative 0.7% annually over both the near and long term. While this is a likely outcome, growth of advanced manufacturing firms and efforts by local governments to implement business attraction and expansion programs could shift this historical trend toward net new job growth.

**Figure 17: Alternative Development Scenarios**



**B. Slow Growth Rate - Extension of Post-Recession**

**Employment Growth (0.2%):** This scenario assumes that the national economy has rebounded from the Great Recession, the loss of manufacturing jobs is restored over the near term, and economic forces driving the post-recession manufacturing resurgence continue over long-term. Under this scenario there will be a continuation of post-recession employment growth rates and the manufacturing sector along the Northern Waterfront will show modest improvement in the job outlook over the short-term. Should market conditions remain favorable, manufacturing employment will continue to experience slow growth of around 0.2% annually over the long-term.

**C. Modest Growth – Business Expansion Supported by Advanced Manufacturing and National Economic Trends (1.2%):** As the national economy improves, local manufacturing industries are assumed to expand their output and hiring, supported by national economic growth. To remain competitive, more local companies invest in equipment upgrades and adopt advanced manufacturing technologies and processes. A workforce survey in late 2012 found that advanced manufacturing firms in Contra Costa County expected to show employment growth of 2.8% annually over the next three to five years. To continue this trend over the long-term, many of the

firms will need assistance with market expansion and financing of new equipment. The survey of manufacturers in the Northern Waterfront found that approximately 33% of the respondents were considering expansion within the next two years. Of those looking to expand, 78% of them are planning to invest in new equipment and 53% require financial assistance to do so. Assuming existing firms are able to expand as planned, the manufacturing sector in the Northern Waterfront can expect to see modest employment growth of around 1.2% annually.

**D. Business Attraction Strategies - Supported by Local Policies and Investment Programs (1.7%):** Rising labor rates in China and other countries, along with increased productivity by American workers have reduced the labor cost advantage to a point where manufacturing in the U.S. is more competitive, especially for high-value, capital intensive industries. In addition, rising energy prices have made global transportation and manufacturing more expensive. At the same time, the recent boom in U.S. oil and gas production has created a dual benefit for U.S. manufacturers by increasing the demand for machinery and chemicals to extract the oil and gas while providing them with an inexpensive reliable energy supply. Studies by PwC, Boston Consulting

**TABLE 11: Projection of Historical Employment Trends in the Northern Waterfront Over the Short and Long Term by Manufacturing Subsector**

NAICS Code	Industry Group	2013 Jobs	2018 Projected Jobs	Change	Growth Rate	2023 Projected Jobs	Change	Growth Rate
311	Food Products	408	560	152	37.3%	637	77	13.8%
312	Beverage Products	15	21	6	40.0%	25	4	19.0%
313	Textile mills	<10	<10	0	0.0%	<10	0	0.0%
314	Textile product mills	<10	<10	0	0.0%	<10	0	0.0%
315	Apparel and other textile products	34	21	-13	-38.2%	12	-9	-42.9%
316	Leather and leather products	0	0	0	0.0%	0	0	0.0%
321	Lumber and wood products	32	39	7	21.9%	48	9	23.1%
322	Paper and allied products	26	<10	0	0.0%	<10	0	0.0%
323	Printing and publishing	127	112	-15	-11.8%	101	-11	-9.8%
324	Petroleum and coal products	3,137	2,996	-141	-4.5%	2,783	-213	-7.1%
325	Chemicals and allied products (except pharmaceuticals)	328	165	-287	-51.9%	148	-81	-30.5%
3254	Pharmaceuticals and Medicines	225	101	-124	-55.1%	37	-64	-63.4%
326	Plastic and Rubber products	15	15	0	0.0%	18	3	20.0%
327	Stone, clay, glass, and concrete products	233	216	-17	-7.3%	238	22	10.2%
331	Primary metal	804	1,115	311	38.7%	1,323	208	18.7%
332	Fabricated metal products	324	315	-9	-2.8%	331	16	5.1%
333	Machinery and equipment	130	120	-10	-7.7%	120	0	0.0%
334	Computer & Electronic Products	683	453	-230	-33.7%	348	-105	-23.2%
335	Electrical equipment and appliances	127	102	-25	-19.7%	107	5	4.9%
336	Transportation equipment	78	83	5	6.4%	96	13	15.7%
337	Furniture and fixtures	106	92	-14	-13.2%	75	-17	-18.5%
3391	Medical equipment and supplies	419	436	28	5.7%	442	20	3.9%
3399	Misc. manufacturing industries	71	82	11	15.5%	96	14	17.1%
<b>Total</b>		<b>7,325</b>	<b>7,057</b>	<b>-268</b>	<b>-3.4%</b>	<b>6,991</b>	<b>-59</b>	<b>-0.8%</b>

Source: EMSI Covered Employment 2013.3

Group, and others suggest that these trends may be the beginning of long-term structural changes supporting a U.S. manufacturing resurgence and reshoring.<sup>19</sup> By adopting a business attraction program to attract companies that are expanding or relocating in targeted industries, the Northern Waterfront would benefit by a higher rate of job growth than just the expansion of local firms.

- E. Targeted Cluster Growth - Driven by Innovation and Industry Linkages (2.5%):** The geographic clustering of companies in the same industry or related industries, along with supporting educational institutions, research labs, business and labor associations, suppliers, and professional services in engineering, finance, legal, and management consulting that support them, creates a competitive advantage for companies that leads to higher wages and stronger employment growth. Cluster formation and growth tends to occur organically, but can be stimulated by public policies. A study by the Brookings Institute<sup>20</sup> found that “the nature and duration...[of a manufacturing renaissance in the U.S.] is going to be highly shaped by the local dynamics of regional supply chains and industry clusters. Market forces alone will not produce the clustering needed in order to reverse the decades-long erosion of the U.S. manufacturing base. All too often, state and local governments pursue policies that encourage firms to compete on the basis of being the lowest cost location. Efforts to attract manufacturers with low labor costs and financial incentives are a “race-to-the-bottom.” Local policies that support innovation, workforce training, capital investment, industry collaboration/interaction, and a positive business climate help to encourage clustering. This policy prescription differs from the traditional business attraction incentives that have dominated local economic development policy. Focusing on strengthening targeted industry clusters, the Northern Waterfront can realize a

<sup>19</sup> PriceWaterhouseCoopers, “A Homecoming for U.S. Manufacturing?: Why a resurgence in U.S. manufacturing may be the next big bet”, September 2012

<sup>20</sup> Brookings Institute, “Locating American Manufacturing: Trends in the Geography of Production”, April 2012

much higher rate of job growth than a strategy based on financial incentives and low labor costs.

- F. Enhanced Growth – Driven by National Public Policy (3.2%):** Major policy changes by federal, state, and local governments to proactively address the challenges facing the manufacturing sector are needed to promote sustainable growth around targeted industry clusters. A recent study by the Aspen Institute<sup>21</sup> found that with policy changes at the Federal level, U.S. manufacturing firms could recapture lost market share in both foreign and domestic markets. Federal policy changes will be needed in foreign trade, energy, tax, basic and applied research, regulatory environment, and workforce development. This scenario also assumes that local governments will take actions to strengthen targeted industry clusters with the potential for growth, make commitments to long-term infrastructure investment programs, streamline regulatory processes, protect industrial zoned properties, implement business attraction programs to capture manufacturing firms that are relocating/expanding along with their key suppliers, and provide export and business assistance to companies looking to expand beyond their immediate Bay Area and Northern California markets. This scenario won’t be easy to achieve, but it is possible over the long-term with a sustained effort by various levels of government.

## Multiplier Effect

Manufacturing supports high wage jobs and requires a wide range of raw materials, energy, and services from a broad array of industries including engineering firms, wholesale trade, warehouse/distribution, transportation, and construction. According to the Manufacturing Institute the multiplier effect of manufacturing is stronger than other sectors. Locally, the manufacturing sector has a job multiplier of 7.78 as result of each manufacturing job added due to the high average wages paid to workers and local spending for materials and services to support the manufacturing process.

<sup>21</sup> Aspen Institute, “The Manufacturing Resurgence: What it Could Mean for the U.S. Economy, A Forecast for 2025”, March 2013

**TABLE 12: Estimated Utilization of Existing Industrial Space**

Industry Sector	Number of Workers	Space per Worker (sq. ft.)	Estimated Demand (sq. ft.)
Manufacturing	7,322	892	6,531,224
Wholesale Trade	841	1,000	841,000
Warehouse/Distribution	2,445	1,685	4,119,825
<b>Subtotal</b>	<b>10,608</b>	<b>1,083</b>	<b>11,492,049</b>
<b>Estimated Underutilized Space</b>			<b>956,816 (7.7%)</b>

Source: Energy Information Administration, Manufacturing Energy Consumption Survey, 2006 NAIOP Research Foundation, Logistics Trends and Specific Industries that Will Drive Warehouse and Distribution Growth and Demand for Space, March 2010

## Estimated Demand for Space Due to Employment Growth

Estimating the demand for industrial space is dependent upon several factors including projected job growth, the type of space and the purpose for which it is being used, space utilization rates, and other factors. Light industrial space is often used for office activities by non-manufacturing firms, which increases the number of workers per square foot in calculating space utilization. Flex-space, for example, is used for a variety of activities including office, warehouse, R&D, and light manufacturing. It is not known what the space utilization ratio is for existing buildings in the Northern Waterfront or how much space is partially occupied, but not fully utilized, by a company. This underutilized (or shadow) space most likely will be absorbed first when a firm expands before it leases or builds new facilities. The stock of “shadow space” means less actual demand for space than is reflected in the vacancy rate. Shadow space is defined as space that is leased or owned but not currently utilized because of layoffs, reorganizations, or other factors. The amount of underutilized space is not reflected in the industrial real estate market data. Also not included in the data are major industrial facilities such as refineries, which are occupied by owner-users.

## Space Requirements per Employee

The demand for industrial real estate can be estimated based on projected employment growth using the average square footage of space per employee and the

number of employees in each manufacturing subsector. The average space requirement per employee for different subsectors is shown in *Table 12*. Based on Energy Information Administration (EIA) survey data, the average square feet per employee for manufacturing and warehouse space ranges from 429 to 1,558 square feet (see *Table A6* in the Appendix). At the low end of the range are industries such as electronic products, apparel, and printing that require less space per employee. At the high end of the range are industries such as paper products, textiles, and primary metal manufacturing that use more equipment, resulting in the need for more space per employee. The average number of square feet per employee has changed over the past decade as industries have become more efficient or have added space-consuming equipment.

## Estimated Space Demand

The Northern Waterfront currently has 13,731,865 square feet of industrial space. The vacancy rate stands at around 9.3% with net absorption of 122,000 square feet year-to-date at the end of Q2-2013. Approximately 1,283,000 square feet is currently vacant and available for lease. The remaining space (12,448,865 square feet) is occupied by 10,608 workers, representing a utilization ratio of approximately 1,174 square feet per employee. *Table 12* shows the estimated demand for industrial space based on industry standards. Given that the current utilization ratio is higher than industry norms suggests that some of the existing inventory of industrial space, which includes manufacturing, warehouse/distribution, and flex-space is either occupied by large

space consuming industries with a lot of equipment or is underutilized shadow space. At an average occupancy ratio of 1,083 square feet of space per employee, the underutilized space could represent five to ten percent of the leased industrial space in the Northern Waterfront. The underutilized space would need to be absorbed before existing companies will require any significant amount of new space. The amount of vacant space available for lease also needs to be reduced before any significant amount of new space is built. In three of the past six years, the net absorption of industrial space has been negative as the local real estate market recovered from the recession (see **Figure 18**).

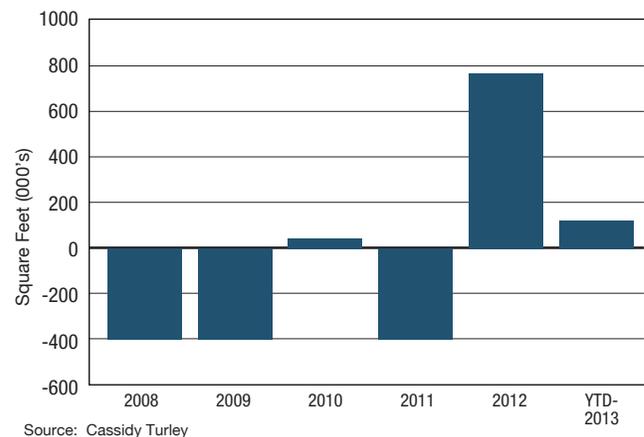
Based on projected job growth, the demand for industrial space will vary depending upon the alternative development scenario. Under the historic trend baseline growth scenario, the demand for industrial space will slowly decline by 300,000 to 365,000 square feet over the next ten years. With improved market conditions and nominal job growth the demand for industrial space will slowly improve helping to absorb the vacant space and stimulating some new development. Assuming modest net new job growth under the two mid-range scenarios (see **Table 13**), the number of net new jobs over the next five years will create a cumulative demand for about 500,000 to 700,000 square feet of new industrial space in the early years and growing to between 2 to 5 million square feet by Year 20, approximately 15% to 25% of the current base of industrial space, depending on the projected job growth.

## Estimated Land Requirement

There are approximately 5,655 acres of industrial zoned land in the Northern Waterfront (see **Table 5**). Of the 361 industrial zoned parcels, 85 parcels of various sizes totaling 1,412 acres are vacant (see **Table 14**). Parcels less than one acre in size have limited development options for large scale industrial users.

Using average floor area ratios (FAR) of 0.40 to 0.50 for industrial development, the job growth and space projections translate into approximately 123 to 183 acres of industrial zoned land needed to meet the

**Figure 18: Net Absorption**



projected mid-range manufacturing job growth and space demand (see **Table 15**). The acreage requirement could more than double if the high growth scenarios were realized. Additional industrial land will also be required for wholesale trade and warehouse/distribution space. This assumes that all of the new manufacturing jobs will create a demand for new space. In actuality, many of these new jobs could be accommodated in the initial five year forecast period through absorption of underutilized space and existing vacancies. Looking at the cumulative demand for industrial space over the long term, approximately 2 to 5 million square feet of new industrial space will be needed to meet the projected job growth associated with the two mid-range Alternative Development Scenarios. This creates a total industrial land requirement ranging from 125 to 200 acres. This requirement can easily be met with existing vacant industrial zoned land if it is protected from conflicting adjacent land uses or the conversion to other uses.

**TABLE 13: Estimated Space Demand for Mid-Range Development Scenarios**

Year	Scenario #3 CAGR – 1.2%			Scenario #4 CAGR – 1.7%			Scenario #5 CAGR – 2.5%		
	Total Jobs	Net New Jobs	Estimated Space Demand	Total Jobs	Net New Jobs	Estimated Space Demand	Total Jobs	Net New Jobs	Estimated Space Demand
2013	7,325			7,325					
1	7,413	88	95,196	7,450	125	134,861	7,508	183	198,324
2	7,502	177	191,534	7,576	251	272,014	7,696	371	401,607
3	7,592	267	289,028	7,705	380	411,499	7,888	563	609,971
4	7,683	358	387,692	7,836	511	553,355	8,085	760	823,545
5	7,775	450	487,540	7,969	644	697,622	8,288	963	1,042,458
6	7,868	543	588,586	8,105	780	844,342	8,495	1,170	1,266,844
7	7,963	638	690,845	8,242	917	993,557	8,707	1,382	1,496,839
8	8,058	733	794,331	8,383	1,058	1,145,308	8,925	1,600	1,732,585
9	8,155	830	899,058	8,525	1,200	1,299,639	9,148	1,823	1,974,224
10	8,253	928	1,005,043	8,670	1,345	1,456,593	9,377	2,052	2,221,904
11	8,352	1,027	1,112,299	8,817	1,492	1,616,216	9,611	2,286	2,475,776
12	8,452	1,127	1,220,842	8,967	1,642	1,778,552	9,851	2,526	2,735,994
13	8,554	1,229	1,330,688	9,120	1,795	1,943,648	10,098	2,773	3,002,719
14	8,656	1,331	1,441,852	9,275	1,950	2,111,551	10,350	3,025	3,276,111
15	8,760	1,435	1,554,350	9,432	2,107	2,282,307	10,609	3,284	3,556,338
16	8,865	1,540	1,668,198	9,593	2,268	2,455,967	10,874	3,549	3,843,571
17	8,972	1,647	1,783,412	9,756	2,431	2,632,579	11,146	3,821	4,137,985
18	9,079	1,754	1,900,009	9,922	2,597	2,812,194	11,425	4,100	4,439,759
19	9,188	1,863	2,018,004	10,090	2,765	2,994,862	11,710	4,385	4,749,077
20	9,299	1,974	2,137,416	10,262	2,937	3,180,635	12,003	4,678	5,066,128

Source: Craft Consulting Group calculations

**TABLE 14: Vacant Industrial Parcels and Acreage in the Northern Waterfront**

	# of Parcels	Total Acreage	Average Size Parcel
Under 6,000 sf	6	0.59	0.08
6,000 - 19,999 sf	7	2.08	0.30
20,000 - 43,560 sf	3	1.84	0.61
1 - 9.9 ac	40	142.28	3.56
10 - 24.9 ac	11	176.10	16.01
25 - 99 ac	16	886.06	55.38
100+ ac	2	202.91	101.46
<b>Total</b>	<b>85</b>	<b>1,411.86</b>	<b>16.42</b>

Source: First American Title

**TABLE 15: Acreage Requirement for Projected Manufacturing Sector Employment Growth**

Year	Current Industrial Space Inventory	Floor Area Ratio (FAR)	Growth Scenario #3		Growth Scenario #4	
			Cumulative Space Demand	Land Acreage Requirement	Cumulative Space Demand	Land Acreage Requirement
Current Total	13,731,865					
5		0.40	487,540	28.0	697,622	40.0
10		0.40	1,005,043	57.7	1,456,593	83.6
15		0.40	1,554,350	89.2	2,282,307	131.0
20		0.40	2,137,416	122.7	3,180,635	182.5

Source: Craft Consulting Group calculations

# Northern Waterfront's Role in the 21<sup>st</sup> Century

## Current Role of the Northern Waterfront

**T**HE ROLE OF Contra Costa County's Northern Waterfront has not changed much since the beginning of the previous century. The Northern Waterfront continues to offer a number of important advantages for industrial development given its waterfront access with deep-water channels and marine terminals, proximity to two Class I railroad lines, electric generating capacity, large parcels of industrial zoned land, available workforce, existing industrial base, connections to regional highway networks, and other assets. Many of the companies that located along the Northern Waterfront around the early 1900s are still in operation and form the basis for several industry clusters. However, much of the Northern Waterfront consists of older industrial areas that have been in decline over the past several decades, are vacant or underutilized, or are "at risk" of being converted to other uses. Although the area is in transition, many of the assets are still present as the Northern Waterfront seeks a new role in the 21st century global economy.

The outlook for industrial development along the Northern Waterfront is dependent in part on (1) national and global trends impacting the manufacturing sector, (2) the attractiveness of the Northern Waterfront as an industrial location for expanding and relocating companies, and (3) public policy at the federal, state, and local levels.

Concerns over global macroeconomic decline due to the recent recession will abate; and the need to focus on business growth and competitiveness will become paramount. The ability to grow employment in the manufacturing and goods movement sectors will be influenced by a combination of market forces and public policies. Local governments can directly address



*Carquinez Bridge looking east along the Northern Waterfront*

business attraction and expansion through public policies, infrastructure investment, and business support programs. Joint marketing of the region for attraction of advanced manufacturing and emerging industries, assistance with exporting, streamlining the regulatory process, improvements to the local business climate, and adoption of workforce training programs represent examples of best practices for regional collaboration, which local governments along the Northern Waterfront can implement to help drive economic growth and industrial development.

The vision for the Northern Waterfront should represent the combined input of multiple stakeholders working together towards a common objective for the future economic development of the area as a working waterfront. The water/rail/energy complex that converges around the Northern Waterfront has long supported industrial development, especially heavy industry like primary metals, petroleum refining, chemicals, and energy generation. These water-dependent users are in mature industries in which technological developments have raised productivity and reduced labor requirements. Given their need to source raw materials and intermediate inputs, and to ship finished products, large-scale industries typically



require maritime and rail locations that handle bulk cargo. Other manufacturing subsectors involved with light manufacturing, assembly, and R&D have a broader range of industrial locations from which to choose.

The 20th century waterfront was an accumulation of functions that were best placed on or near the shoreline. It was here, along the Northern Waterfront, where Contra Costa first gained its economic muscle as industries took advantage of the rail lines and waterways to transport their products to markets around the country and the world. The waterfront's strategic location along the Carquinez Strait and Suisun Bay provide the foundation for maintaining the area as a working waterfront. Shipping and manufacturing are two key functions of the waterfront that are still important in the 21st century. Trade is a primary function of a working waterfront with the import and export of raw materials and finished products. Today, however, the Northern Waterfront plays more of a multi-purpose role, not only as an employment center with business parks and industrial development, but also as a place for marinas, maritime support activities, wildlife habitat, and recreational uses.

## Future Role of the Northern Waterfront

The Northern Waterfront is uniquely positioned to support the attraction and expansion of large-scale manufacturing facilities given its many assets. Compared to other parts of Contra Costa County, manufacturing employment is heavily concentrated along the Northern Waterfront with existing industry clusters in several manufacturing subsectors. Major employers include Shell, Dow Chemical, USS-POSCO, C&H Sugar, Bio-Rad, Tesoro, Phillips 66, Henkel Corporation, Bishop-Wisecarver, Parker-Hannifin Corporation, Cemco Steel, Rhodia, and United Spiral Pipe. These companies could anchor several industry clusters.

The opportunity is now emerging for the Northern Waterfront to regain its role as a leading manufacturing location in California. Mid-range employment projections show potential annual employment growth of 1.2% to 1.7% with a cumulative total of 1,974 to 4,678 net new manufacturing jobs being created in the Northern Waterfront over the next 20 years with the support of local government policies and investment. The projected job growth could translate into demand for approximately 2 – 5 million square feet of additional industrial space with job-generating uses. **The main challenge now is how to best adapt and develop the Northern Waterfront into a 21st century economic asset.**

# Target Industries and Clusters

## GROWING THE NORTHERN WATERFRONT'S ECONOMY

requires a strategy that focuses on target industries, which have the potential to enhance and grow the local economy. In order to implement this strategy business attraction, retention, and expansion efforts should be prioritized around growing and emerging industries, particularly those with a presence in the region that show competitive strengths and future growth opportunities. High value-added, capital intensive industries important to the region (see *Figure A2* in the Appendix) should also be targeted along with their supply chain vendors. Criteria used for identifying target industries include historical and projected employment growth, and the geographic concentration and regional specialization of an industry. A data-driven target industry analysis was conducted to identify prospective target industries (see *Table 16*), which were then assigned to one of the following four categories based on their performance:

1. **Growth Industries** - projected to have positive job growth and high employment concentrations. Growth-oriented industries constitute the core strength of the region and represent the best opportunities for growth in other areas, such as related and supporting industries and supplier networks. These industries should be the prime targets for business attraction, retention, and expansion programs.
2. **Emerging Industries** - have low employment concentrations, but positive projected job growth. Although these industries have not yet accumulated a high concentration of employment, companies in these industries should be considered potential business attraction targets due to their high growth rate. The formation of companies in new emerging industries should be encouraged through incubator and technology transfer programs.
3. **Transitioning Industries** - have an above average concentration of employment relative to the national average, but are projected to show little

or no employment growth locally and may even experience job losses over the next five years. Employment growth in these industries is slowing due to various factors, such as a deceleration in market demand, increased external competition, or the adoption of capital intensive production processes which will make a lot of jobs and occupations obsolete as a result of automation and lean business practices, thereby reducing the need for workers. These industries are typically at a stage in their life cycle where they compete in mature markets with low growth. Revenue and productivity may be increasing, while employment is declining due to the adoption of advanced manufacturing technologies and processes. These industries may be important to the region due to high job multipliers, large export markets, or extensive local supply chains and allied industries. These industries may be potential targets for business retention, but should be evaluated on a case by case basis as to their future growth prospects.

4. **Contracting Industries** - are those subsectors that have experienced a recent loss of employment and are projected to show job loss over the short term with below average concentration of employment relative to the national and state averages. These industries typically have a small local presence and may be facing declining or slowing market demand, due to import or external competition, new technology developments, shifting consumer demand, a change in the region's comparative advantage, or other factors. While these industries are experiencing a contraction in employment locally, it does not necessarily mean that the industry is in decline. These industries might benefit from public policies aimed at improving the economic health of the area as a whole (e.g., workforce skills, infrastructure, regulatory environment, and business climate). Business support for these industries should be evaluated on a case by case basis as to the future economic benefits to the region.

**TABLE 16: Target Industry Identification**

GROWTH INDUSTRIES (High Concentration, Positive Growth)		EMERGING INDUSTRIES (Low Concentration, Positive Growth)	
3251	Basic Chemical Manufacturing	3119	Other Food Manufacturing
3311	Iron and Steel Mills and Ferroalloy Mfg	3112	Grain and Oilseed Milling
3115	Dairy Products	3344	Semiconductor and Other Electronic Components
3343	Audio and Video Equipment	3121	Beverage Manufacturing
3113	Sugar and Confectionery Products	3312	Steel Product Manufacturing from Purchased Steel
3259	Other Chemical Products & Preparations	3219	Other Wood Product Manufacturing
3391	Medical Equipment and Supplies	3399	Other Miscellaneous Manufacturing
		3366	Ship and Boat Building
		3327	Machine Shops; Turned Product; Screw, Nut, Bolt
		3273	Cement and Concrete Products
		3118	Bakeries and Tortilla Manufacturing
		3329	Other Fabricated Metal Products
		3363	Motor Vehicle Parts
		3371	Household/Institutional Furniture & Kitchen Cabinets
TRANSITIONING INDUSTRIES (High Concentration, Negative Growth)		CONTRACTING INDUSTRIES (Low Concentration, Negative Growth)	
3279	Other Nonmetallic Mineral Product	3231	Printing and Related Support Activities
3241	Petroleum and Coal Products	3339	Other General Purpose Machinery
3359	Other Electrical Equipment & Components	3323	Architectural and Structural Metals
3379	Other Furniture Related Products	3321	Forging and Stamping
3342	Communications Equipment	3152	Cut and Sew Apparel
3274	Lime and Gypsum Products	3222	Converted Paper Products
3255	Paint, Coating, and Adhesives	3315	Foundries
3345	Navigational, Measuring, Electromedical, and Control Instruments		
3254	Pharmaceutical and Medicine		

## Target Industries

Business attraction, expansion, and retention programs should focus on growth-oriented and emerging industries that will benefit from the Northern Waterfront’s locational advantages. Industries projected to grow over the next ten years include food processing, chemical products, construction materials, primary metals, fabricated metal products,

and medical equipment and supplies. These industries reflect growing global, national, and regional markets. Emerging industries centered on new products or technologies that have a Bay Area presence include biomedical, energy, communications, advanced materials, and cleantech sectors (see *Appendix Table A11* for a description of cleantech market segments). Transitioning industries that are important to the region include biotechnology/life sciences, petroleum refining,

**TABLE 17: Business Attraction and Retention Targets**

1. Food and Beverage Processing	10. Metal Processing and Fabricated Metals
2. Biofuels/Biogas	11. Transportation Vehicles, Equipment, and Parts
3. Recycled Materials and Products Manufacturing	12. Communication Equipment
4. Biotechnology and Life Sciences	13. Navigational, Measuring, and Control Instruments
5. Construction Materials (including green building materials)	14. Advanced Battery Storage
6. Water Purification Technology (equipment, membranes, filters, chemicals)	15. Industrial, Agriculture and Household Chemicals
7. Wind Turbine And Blade Repair, Maintenance, and Refurbishment	16. Environmental Controls and Equipment
8. Machinery	17. Furniture
9. Digital and Electronic Devices and Components	18. Polymers, Coatings, and Adhesives

motor vehicle parts, and electronic instruments. Business attraction and retention targets are shown in *Table 17*. Target industries represent regional strengths and opportunities for employment growth over the long term. These industries form the core that could make-up several industry clusters in the Northern Waterfront.

## Existing Industry Clusters

The Northern Waterfront has several established and nascent industry clusters that should be supported and developed as part of an overall economic development strategy including:

**Transportation Fuels Cluster:** The transportation fuels cluster consists of a diverse mix of small, medium, and large companies involved in the refining and distribution of both carbon-based and alternative fuels. Carbon-based transportation fuels make up the largest segment of employment within the cluster, but have experienced slow or declining job growth over the past decade. Alternative fuels, primarily advanced biofuels and natural gas, is a small emerging segment being driven by federal and state air quality low-carbon fuel standards. Opportunities for attracting biofuel companies exist that would stimulate job growth in this cluster. Core industries in the cluster include petroleum refining, wholesale distribution, and pipeline transportation along with related and supporting industries, service

providers, regulatory agencies, and research institutions. Key companies include Shell, Phillips 66, Tesoro, Golden Gate Petroleum, Telfer Oil Companies, Nalco Energy Services, and Bay Biodiesel. The Northern Waterfront also is part of a larger established transportation fuel cluster centered in Contra Costa and Solano counties.

**Diversified Manufacturing Cluster:** This cluster covers several manufacturing subsectors including chemicals, primary metal, fabricated metal products, machinery, nonmetallic mineral products, computer and electronic components, electrical equipment, and transportation parts and equipment. Core companies include USS Posco, Dow Chemical, General Chemical, Rhodia, United Spiral Pipe, Henkel Corporation Aerospace Material Division, Bishop-Wisecarver Corporation, Precision Technologies, and Merit USA.

**Clean Technology Cluster:** The clean technology sector covers a diverse range of products, technologies, and market segments including energy storage, alternative transportation fuels, emissions controls, recycled materials, green building materials, clean energy, and innovative water technologies that are potential target industries for the Northern Waterfront. Market drivers in the cleantech sector include public policy initiatives, growing market demand for green products, and increasing concern about sustainability and resource scarcity.

The demand for cleantech products is increasing and the number of jobs in the cleantech sector is up 12% globally over the past year and early-stage cleantech companies continue to attract nearly a quarter of the global venture capital available. The East Bay's cleantech cluster has been documented in several studies<sup>22</sup> which show emerging sectors in clean energy, water technology, recycling, and green building. Although the Northern Waterfront has a limited number of cleantech companies this is an emerging sector that is a future growth industry and should be considered as a cluster candidate. The local cleantech sector includes businesses in a variety of market segments. Bay Biodiesel manufactures ASTM quality biodiesel; Loprest Water Treatment Company solves municipal water treatment issues; and Mt. Diablo Recycling Center operates a 90,000 square feet recycling center using state-of-the-art equipment to process approximately 20 tons of recyclables per hour in a single stream, including cardboard, newspaper, mixed paper, tin, aluminum cans, glass, and plastic.

**Food and Beverage Processing Cluster:** The food and beverage processing cluster consists of enterprises whose principal activities are the processing of foods and beverages. The cluster should include a broad array of industries that extend beyond the boundaries of the Northern Waterfront, such as agri-business and the growing and harvesting of crops, wholesale distributors, packagers, breweries, wineries, water bottling, professional services, and companies that provide equipment, support, and products used in processing and packaging. Core companies along the Northern Waterfront include C&H Sugar, Ramar Foods International, Viano Clement Winery, Gelateria Naia, and Brown Cow West. Related and supporting industries include companies like Silgan Containers a manufacturer of metal cans and plastic bottles and Agra Tech a greenhouse manufacturer.

**Life Sciences Cluster:** This cluster is comprised of biotechnology companies, drug manufacturers, medical devices, contract research organizations, medical and dental labs, equipment and lab suppliers, and professional and technical services. The cluster is primarily located in Hercules and North Concord. Core companies include Bio-Rad, Fresenius USA, Sartorius Stedim Biotech, Nordson March Life Sciences, Bay Bioanalytical Laboratory, Eureka Genomics Corp, and Pacific BioLabs. The life science industry in the Northern Waterfront is part of the larger East Bay cluster.

To maximize scarce economic development resources local jurisdictions should focus on promoting the Northern Waterfront as a competitive location for advanced manufacturing firms in the target industries and on strengthening the existing industry clusters in the region.

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<sup>22</sup> Contra Costa Economic Partnership, "East Bay Green Economy Industry Cluster Study", July 2008  
East Bay Green Corridor Partnership, "Mapping the Green Economy in the East Bay"  
Karen Chappel, "Innovating the Green Economy", January 2010

# Recommended Policy Initiatives for Local Governments

**A** UNIQUE OPPORTUNITY is now materializing for the Northern Waterfront to recapture its former role as a leading manufacturing center in California. The convergence of various global trends, market forces, new technologies, and public policies have created opportunities for the Northern Waterfront to attract new manufacturing companies and to expand and diversify its industrial base. Conventional large-scale integrated manufacturing operations are less common as companies seek to minimize costs and provide flexible manufacturing systems and platforms for responding to changing customer demands, technologies, and economics. The preceding sections of this Report have documented these trends while providing specifics on where the greatest opportunities lie. In order to capitalize on these emerging opportunities local governments and stakeholders need to work together to create a new framework for regional cooperation with a clear focus on enhancing the Northern Waterfront as a competitive location for industrial development. Recommendations set forth below outline key strategies and initiatives that can be implemented, both individually and collectively, by local governments working together to promote the economic viability of the Northern Waterfront.

**Long Term Challenge:** Overcoming decades of indifference about the need to invest in industrial development is a problem without a short-term, easy solution. Policies to enhance the economic vitality of the Northern Waterfront and boost manufacturing employment should be designed and implemented with the long-term view in mind, and not just be a quick fix in reaction to the trends of the past 50 years.

“This effort will protect our industrial zoned properties to ensure their future economic potential. It also has the added benefit to pursue a more in-depth land use review and identify additional areas for economic development and job growth.”

“This multi-stakeholder project can only be successful if all cities in the outlined areas are at the table and engaged and working together. As the saying goes, “If we build it, they will come”. This initiative will serve this generation and many more to come. The potential is there, now we need to act and expand on it, together.”

–Supervisor Mary Nejedly Piepho, District III  
Contra Costa County Board of Supervisors  
January 2014

According to The Brookings Institution<sup>23</sup> “the fact that a metropolitan area specializes in slowly growing industries does not mean that the area is more likely to experience slow job growth, at least in the short term. Most of the metropolitan areas in the U.S. had slower job growth than the nation as a whole because of both an unfavorable industrial structure and metropolitan area-specific factors. The latter generally matters more for job growth than does industrial composition. Economic development policy aimed at increasing a metropolitan area’s employment growth rate should focus more on those factors that are fundamental to the economic health of the area as a whole or of existing industries in the area (e.g., workforce skills, infrastructure, innovation and productivity of firms) than on attracting firms in specific targeted new industries.”

<sup>23</sup> Liveris, Andrew N., CEO, The Dow Chemical Company, “Make it in America: The Case for Re-inventing the Economy”, The Brookings Institution, “*The Consequences of Metropolitan Manufacturing Decline: Testing Conventional Wisdom*”, December 2010

**Regional Challenge:** While it is important for all parties to understand the long term nature of the challenges facing the Northern Waterfront, it is equally important for local jurisdictions to work together to formulate and implement economic development programs that benefit the Northern Waterfront as a whole. Many of the problems and solutions are regional in nature and business attraction programs will benefit from a regional brand identity.

Increasingly, the performance and competitiveness of regional economies relies on the development and strength of local industry clusters.<sup>24</sup> Regions with strong clusters typically outperform other local economies. The identification of targeted industries and the alignment of cluster strategies will require collaboration between regional decision-makers and stakeholders to determine a mutually beneficial path for regional growth and economic development.

### Intraregional Coordination of Economic Development Programs and Support Services

Local jurisdictions should collaborate to avoid competition among communities within the Northern Waterfront. There are various degrees of intraregional coordination ranging from the establishment of a formal organization to perform economic development planning, financing, business recruitment, and retention activities to informal coordination that entails jurisdictions within the region talking to each other on a regular or ad-hoc basis, as needed for specific issues. A person should be identified to coordinate

<sup>24</sup> Porter, Michael E, "The Economic Performance of Regions", Regional Studies, August/October 2003. Industry clusters are geographic concentrations of competing and collaborating companies in related economic sectors, as well as related and supporting businesses, specialized suppliers, and associated institutions that enhance the productivity and competitiveness of an industry. Clusters often extend downstream to customers and manufacturers of complementary products and companies in industries related by skills, technologies, or common inputs. Clusters also include governmental and other institutions--such as research labs, universities, standards-setting agencies, think tanks, vocational training providers, and trade associations. Core companies in a cluster typically draw upon a shared talent pool of specialized skilled labor. (Porter, M.E. (1998). "Clusters and the New Economics of Competition," Harvard Business Review, November-December, 1998.)

“Acting regionally means proceeding with a strategy that is focused on the long range use of assets to enhance global competitiveness.”

~ Council on Competitiveness  
Collaborate: Leading Regional Innovation Clusters, 2010

industrial and economic development along the Northern Waterfront. The role of coordinator should be performed by someone who understands both the governmental process and the private sector. The coordinator should also represent the entire Northern Waterfront. The motivating factor for this coordination is the recognition that job creation, business attraction, and infrastructure investment have economic benefits that spill over political boundaries.

### Public Policy Initiatives

Local governments have the ability to influence the health of the local economy in many ways through infrastructure investments, workforce training, land use policies, business attraction and retention programs, financial incentives, and other mechanisms. Public policies should be adopted and coordinated to enhance the Northern Waterfront's competitive advantages. When asked as part of a survey conducted in conjunction with the preparation of this report, "what is your most significant barrier to achieving your expansion goals," local employers identified a number of common impediments including the economy, financing, regulatory environment, foreign competition, insufficient supply of skilled labor, and the cost of utilities and new equipment. Many of these issues fall within local government's ability to influence the provision of cost-effective public services through the adoption of public policies and programs targeted toward specific objectives.

In consideration of the need for public intervention, the following recommended actions are designed to enhance the Northern Waterfront’s competitiveness, promote the growth of targeted industry clusters, and contribute to the region’s long-term economic vitality. The more collective their adoption, the more profound will be the benefit to the Northern Waterfront’s future competitiveness and vitality.

## A. Business Climate & Regulatory Environment

### 1. Protect Existing Supply of Industrial Land

Existing industrial lands along the Northern Waterfront should be protected from incompatible and conflicting land uses and the conversion to non-industrial uses. Very little land exists in the Bay Area, outside of the Northern Waterfront, that is zoned for industrial use in large parcels with rail and water access. Various studies<sup>25</sup> have documented the loss of industrial lands in other parts of the Bay Area, creating an opportunity for preserving and modernizing industrial real estate along the Northern Waterfront for existing and emerging industries. Local governments should protect these lands in order to ensure that an adequate supply of industrial development sites are available for companies looking to expand or relocate their manufacturing operations, thereby helping to strengthen the local and regional economy through job creation.

### 2. Review Development Approval Process and Industrial Zoning

Local governments, including special districts and regional agencies, along the Northern Waterfront should consider reviewing their development approval and building permit processes with the objective of identifying ways to simplify the rules, improve outcome certainty, and shorten the timeline in order to eliminate any undue

<sup>25</sup> Hausrath Economics Group and Cambridge Systematics, “A Land Use Strategy to Support Regional Goods Movement in the Bay Area”, September 2004

and unnecessary requirements that may make the Northern Waterfront less attractive or uncompetitive as an industrial location. Emphasis should be placed on approving industrial uses meeting all applicable performance standards and zoning regulations without the need for discretionary review and approval on a case-by-case basis. Recent research into land use planning and zoning practices for industrial development recommends the following:

- Use of performance standards to mitigate potential adverse impacts such as sound, smoke, odor, fumes, dust, glare, emissions, vibration, and other environmental impacts. Industrial uses that meet the minimum requirement or maximum allowable standards and comply with all applicable zoning regulations should not require the development of mitigation measures on a case-by-case basis;
- Updating lists of permitted land uses that may be incomplete or out-of-date and replace with a thorough definition and description of allowed industrial uses and activities;
- Adoption of policies, ordinances, and interagency agreements to protect industrial land from incompatible uses or the conversion to non-industrial uses;
- Reducing uncertainty by eliminating requirements for administrative reviews of conditional uses with a clearly defined approval process and predictable timelines for uses that meet all applicable performance standards.

The review of industrial land use regulations should be coordinated among local jurisdictions within the Northern Waterfront. Currently, there is variation among local jurisdictions with different land use designations, permitted uses, development standards, and permitting requirements (see **Table A9** in the Appendix). Industrial zoning should be coordinated when practical so that there are similar development standards and land use designations.

### 3. Identify Priority Development Areas for Advanced Manufacturing

To the extent possible, consideration should be given to identifying industrial sites that are development-ready with permitted uses, preliminary environmental clearances, local road improvements, and utilities in place that are designed to attract advanced manufacturing and clean technology companies. These sites could be actively marketed as part of a collective, region-wide business attraction program.

## B. Infrastructure Investment

### 1. Improve Goods Movement Infrastructure

The economic vitality of the Northern Waterfront depends upon a multimodal transportation system that enables the reliable, efficient, and cost-effective movement of goods and freight not only within the region, but domestically and internationally. As companies grow and expand they need to reach markets outside their local area. Improvements are needed to the goods movement infrastructure along the Northern Waterfront in order to improve the transport of raw materials and finished goods into and within the region and to external markets. Transportation improvements include deepening and maintenance dredging for the shipping channel traversing the San Pablo Bay, Carquinez Strait, and Suisun Bay (USACE Dredging Plan), improved access to the I580/205 corridor (SR-239 Tri-Link Study), completion of SR-4 improvements (CCTA), local road improvements (see list of planned or proposed street and highway improvements in Table A10 of the Appendix), and the identification of future maritime and rail improvements. Local agencies should collaborate on prioritizing the regional transportation improvements based on their relative transportation benefits to the Northern Waterfront.

### 2. Identify Needed Utility Improvements

Service providers (including cities and special districts) should work together to identify needed utility improvements to support industrial development in the Northern Waterfront and prepare, as necessary, master plans for the extension of sewer and water lines, water and wastewater treatment plant capacity upgrades, electric grid improvements, and the expansion of advanced telecommunications infrastructure such as fiber-optic cable, that meet the needs of advanced manufacturing operations. The various agencies serving the Northern Waterfront should work collectively to investigate potential funding sources at the federal, state, and regional levels, such as infrastructure grant funding or the establishment of an infrastructure financing district.

## C. Development Incentives and Financing

### 1. Develop Financing Programs and Investment Incentives

Explore federal, state and regional programs for financing transportation and utility infrastructure, business assistance programs, new equipment purchases, and workforce training. Develop a package of financing programs and investment incentives that are tailored to the needs of the Northern Waterfront and can be used by economic development managers, Small Business Development Center, Workforce Development, Transportation Agencies, and Special Districts. Business incentive and financing programs<sup>26</sup> such as sales and use tax exclusion, hiring credits, industrial development bonds, and other programs like U.S. Small Business Administration (SBA) loans, PG&E rebates and rate reduction programs, Recycling Market Development Zone Loan Program, and business improvement districts should be explored. Collaborate on developing regional financing programs.

<sup>26</sup> Governor's Office of Business & Economic Development, State Business Investment Guide, September 2013

## 2. Promote the Economic Benefits of a Foreign Trade Zone

Develop and actively market the economic advantages of a Foreign Trade Zone (FTZ). Several FTZ's exist in the Bay Area including Oakland #56, San Jose #18, and San Francisco #3. Stockton and Sacramento also have an FTZ. The Port of San Francisco's FTZ #3 was recently expanded to include Contra Costa County. Subzones include Chevron, Tesoro, and Valero's marine terminals. A foreign trade zone provides economic benefits for international businesses looking to establish or expand their presence in the U.S. market. In order to take advantage of the FTZ's benefits a local program for the Northern Waterfront should be developed and actively marketed.

## D. Regional Branding and Marketing

### 1. Develop and Implement Regional Marketing Program

Local jurisdictions along the Northern Waterfront should collaborate in marketing and promoting the Northern Waterfront as a prime location for industrial development including identifying key regional assets and competitive advantages, establishing a regional brand image and identity, and promoting the area through a branded website, industrial brokers, and trade shows. Policy-makers should develop and implement a regional marketing plan for business attraction and expansion that focuses on targeted industries, as well as create a website and marketing collateral to promote the region as a sought-after 21st century center for advanced manufacturing.

### 2. Develop and Implement Business Expansion and Attraction Programs Focused on Targeted Industries

Local communities should establish and implement business attraction, retention, and expansion programs focused on advanced manufacturing and emerging industries such as advanced biofuels, recycled materials, and green building materials.

A strategy should be developed to recruit firms that can strengthen and add value to targeted industry clusters. Business support services should be provided to small and medium-sized businesses to increase the productivity and competitiveness of local firms. Over the long term, local governments along the Northern Waterfront should focus on growth-oriented and emerging industries with high job multipliers that are expanding beyond serving just local markets.

## E. Cluster Development, Innovation, & Productivity

### 1. Support and Strengthen Existing and Emerging Industry Clusters

The presence of a critical mass of existing companies in several manufacturing subsectors indicates the existence of several industry clusters in Transportation Fuels, Diversified Manufacturing, Clean Technology, Food and Beverage Processing, and Life Sciences. These industry clusters should be supported and cultivated as part of an economic development strategy. In addition to the actions outlined above, local governments can take various actions to strengthen and support the development of the targeted industry clusters by:

- Conducting periodic cluster assessments of existing and emerging clusters to determine their viability, relative strength, and competitiveness. Although an industry cluster may functionally exist, the firms in the cluster may not recognize that they are part of a cluster or how it functions. By identifying a cluster local governments raise awareness of its existence. While local government may identify industry clusters through their study of the economy, they do not create industry clusters, nor should they try to lead the clusters. Instead, local government's role should be to facilitate the meeting of cluster members, conduct research to help the cluster define itself, and respond to cluster priorities with appropriate and requested assistance. To work effectively as a cluster,

the industries and firms in it must recognize their role and determine how they can work together to enhance their productivity and competitiveness. Industry must take the lead role in identifying and addressing issues that are important to industry, while government and others can play a facilitation and supportive role. A cluster strategy helps an industry set priorities and establish a constructive relationship with government.

- Sponsoring cluster conferences and forums to promote networking opportunities for participants. Venues should be created where industry, government agencies, service providers, workforce training organizations, and others can interact to discuss issues important to the competitiveness of the cluster.
- Establishing government procurement programs to purchase goods and services from local companies.
- Facilitating opportunities for local companies to expand in international markets. Export assistance is provided by the SBA, U.S. Department of Commerce, U.S. Export-Import Bank, and other public and private organizations.

## F. Business Development and Support Services

### 1. Provide Coordinated and Targeted Business Support Services

Provide coordinated and targeted business support services to startup companies, and small and medium-sized manufacturing businesses in the Northern Waterfront. Business development services could be provided through the local Small Business Development Center (SBDC), the Corporation for Manufacturing Excellence (Manex), and community colleges in the areas of management, finance, marketing, supply chain, strategic planning, innovation and product design, process improvements, and green manufacturing.

### 2. Support Expansion of Start-up and Small Manufacturing Firms

Emerging growth companies drive employment growth. A small business consulting program to address marketing, financing, and operational issues will help facilitate increased productivity and higher profits. Workforce training programs customized for small businesses will help retain employees and increase competitiveness through skills upgrade training for existing full-time employees. Incubators could be developed with low-cost space and support services for start-up businesses in targeted industries, along with mentoring and business advice. Local incubator programs such as JFK University's Institute of Entrepreneurial Leadership Business Accelerator in Concord, iGATE Innovation Hub in Livermore, and the Commercial Kitchen in Brentwood provide support for entrepreneurs launching new business ventures.

### 3. Capture Innovation Locally

Innovation and entrepreneurship will help drive the manufacturing renaissance. Local governments should collaborate with university and research lab technology transfer offices in the early stages of a company's due diligence process to facilitate technology transfer and commercialization from local research institutions and proactively encourage companies and entrepreneurs using locally developed technologies to locate in the Northern Waterfront. Local governments should support the incubation of start-up and early-stage companies and consider the establishment of an advanced manufacturing incubator and training facility.

## G. Workforce Development

### 1. Prepare Skilled Workforce for Advanced Manufacturing Jobs

Advanced manufacturing jobs require a workforce with different skill sets than those of past eras. The education and workforce training system should be refocused to produce workers with specialized

technical skills in advanced manufacturing occupations, such as high-end automation, material-sciences, precision engineering, and logistics based on industry's needs. The County's Workforce

Development Board recently adopted an advanced manufacturing sector strategy that is in the process of being implemented that will benefit businesses in the Northern Waterfront.

## Conclusions

The outlook for industrial development along the Northern Waterfront although uncertain, is favorable given the convergence of various global and national economic trends. Long-term structural changes in the global economy combined with changes in public policy will support the resurgence and reshoring of manufacturing jobs in the U.S.

“Policy makers will need to recognize that every country is going to compete for global manufacturing industries. Governments will need to invest in building up their comparative advantages – or acquiring new ones – to increase their appeal to globally competitive and productive companies. As governments compete, they can help tilt the decisions for these companies by taking a comprehensive view of what multinational corporations need: access to talent, reliable infrastructure, labor flexibility, access to necessary materials and low-cost energy, and other considerations beyond investment incentives and attractive wage rates.”<sup>27</sup>

By adopting an economic development strategy to enhance and strengthen its competitive advantages, the Northern Waterfront has the potential to become a more attractive location capable of capturing its share of the projected growth in manufacturing employment. In order to overcome decades of declining industrial employment, local governments must work in a collaborative manner to address the challenges faced by the Northern Waterfront and jointly market the area for the attraction and expansion of manufacturing firms. Mid-range employment projections illustrate a reasonable forecast for industrial expansion along the Northern Waterfront, assuming local governments

“As manufacturing evolves, policy makers must adjust their expectations...The role of policy in manufacturing is largely about enabling and creating an environment for competitive and innovative companies to flourish, helping create sustainable conditions for local manufacturing.”

– McKinsey Global Institute  
*Manufacturing the Future*

take the necessary public policy actions with a focus on attracting high value-added industries, strengthening targeted industry clusters, developing a skilled workforce, improving the business climate, marketing the region, and investing in needed transportation and utility infrastructure improvements.

The window of opportunity for the Northern Waterfront will not remain open forever and competition from other regions is strong. To gain a competitive advantage, local policy-makers should act collectively, decisively, and strategically, without delay, in order to establish the Northern Waterfront as a competitive location for advanced manufacturing in the 21st century.

<sup>27</sup> McKinsey Global Institute, “*Manufacturing the future: The next era of global growth and innovation*”, November 2012



# Appendix

**TABLE A1: Manufacturing Employment Growth Assumptions**

		EDD			EMSI			Shift Share Analysis			Advanced Mfg Growth
NAICS Code	Industry Description	2009 Jobs	2012 Jobs	Annual Growth Rate (%)	2013 Jobs	2018 Jobs	Annual Growth Rate (%)	Industry Mix	National Growth	Annual Growth Rate (%)	Annual Growth Rate (%)
311	Food Manufacturing	1,326	1,644	6.0%	408	560	7.5%	0.2%	25	1.2%	6.0%
312	Beverage and Tobacco Products	199	231	4.0%	15	21	8.0%	0.6%	1	1.3%	4.0%
313	Textile Mills	0	0	0	<10	<10	0.0%	-1.2%	0	0.0%	0
314	Textile Product Mills	26	20	-5.8%	<10	<10	0.0%	-2.1%	0	0.0%	-5.8%
315	Apparel Manufacturing	183	167	-2.2%	34	21	-7.6%	-2.9%	2	1.2%	-2.2%
316	Leather and Allied Products	0	0	0	0	0	0.0%	0.1%	0	0.0%	0
321	Wood Products	340	292	-3.5%	32	39	4.4%	-1.4%	2	1.3%	-3.5%
322	Paper Manufacturing	67	45	-8.2%	26	9	-13.1%	-1.6%	2	1.5%	-8.2%
323	Printing and Related Support Activities	435	457	1.3%	127	112	-2.4%	-3.0%	8	1.3%	4.9%
324	Petroleum and Coal Products	7,810	6,650	-3.7%	3,137	2,996	-0.9%	-0.7%	190	1.2%	0.4%
325	Chemical	1,987	1,283	-8.9%	553	266	-10.4%	-0.5%	34	1.2%	4.4%
326	Plastics and Rubber Products	124	47	-15.5%	15	15	0.0%	0.8%	1	1.3%	-15.5%
327	Nonmetallic Mineral Products	439	358	-4.6%	233	216	-1.5%	-1.5%	14	1.2%	-4.6%
331	Primary Metal	803	916	3.5%	804	1,115	7.7%	2.5%	49	1.2%	3.2%
332	Fabricated Metal Products	863	866	0.1%	324	315	-0.6%	1.9%	20	1.2%	3.2%
333	Machinery	401	561	10.0%	130	120	-1.5%	1.9%	8	1.5%	2.8%
334	Computer and Electronic Products	2,169	1,919	-2.9%	683	453	-6.7%	-0.9%	41	1.2%	11.1%
335	Electrical Equipment, Appliance, and Components	137	172	6.4%	127	102	-3.9%	0.1%	8	1.3%	23.7%
336	Transportation Equipment	51	109	28.4%	78	83	1.3%	2.0%	5	1.3%	28.4%
337	Furniture and Related Products	566	513	-2.3%	106	92	-2.6%	-2.1%	6	1.1%	2.8%
339	Miscellaneous Manufacturing	1,004	1,102	2.4%	490	518	1.1%	-0.1%	30	1.2%	2.4%
	<b>Total</b>	<b>18,930</b>	<b>17,352</b>	<b>-2.1%</b>	<b>7,325</b>	<b>7,057</b>	<b>-0.7%</b>	<b>0.2%</b>	<b>444</b>	<b>1.2%</b>	<b>3.5%</b>

Source: EMSI, California Employment Development Department Labor Market Information, Survey of Advanced Manufacturing Firms in Contra Costa County

**TABLE A2: Northern Waterfront Competitive Assessment**

Strengths, Weaknesses, Opportunities, and Threats

Major Industrial Site Location Factors			
Indicator	Strengths	Weaknesses	
<p><b>Location</b></p> <ul style="list-style-type: none"> <li>• Access to key inputs, raw materials and resources</li> <li>• Proximity to major markets</li> <li>• Proximity to major suppliers</li> </ul>	<ul style="list-style-type: none"> <li>• Centrally located in a growing regional economy, the Northern Waterfront is in close proximity, within a half-day transit, to major markets in the Bay Area and Sacramento and sources of raw materials and production inputs in the San Joaquin Valley and Southern California. This is within less than half-day or 2.5 hour drive time (approximately 100 miles) of a population of 11.5 million.</li> <li>• More than 55% of the manufacturers in the Northern Waterfront source their inputs from the Bay Area and Northern California suppliers and 12% from Southern California suppliers.</li> <li>• Altamont Pass and Montezuma Hills Wind Farms are in close proximity to the Northern Waterfront.</li> <li>• There is an existing concentration of industrial uses.</li> </ul>	<ul style="list-style-type: none"> <li>• Residential land uses are incompatible with the needs of industry and encroachment issues exist.</li> <li>• Citizens in the area may protest more industry because the presence of manufacturing and cargo handling facilities generally increases deleterious effects on the community such as traffic, noise, bright lights, noxious odors, and air pollution.</li> </ul>	Internal Factors
<p><b>Facilities/Land</b></p> <ul style="list-style-type: none"> <li>• Available buildings</li> <li>• Available land</li> <li>• Occupancy costs</li> </ul>	<ul style="list-style-type: none"> <li>• Available buildings and industrial sites are plentiful. Approximately 1,283,151 square feet of industrial space is available for lease with a 9.3% vacancy rate.</li> <li>• Buildings currently on the market for lease include warehouse, manufacturing, R&amp;D, and Flex Space.</li> <li>• Asking rental rates range from around \$0.28 to \$1.26 per square foot (depending on location and quality), with an average asking rate of \$0.43 per month triple net.</li> <li>• Out of 109 total vacant parcels, 85 parcels are unimproved and zoned for industrial development.</li> </ul>	<ul style="list-style-type: none"> <li>• Approximately 39.2% of the buildings in the Northern Waterfront are more than 50-years old. While exact figures are not available, much of what remains vacant are older outdated properties bordering on obsolescence.</li> <li>• Many sites are brownfields that will be expensive to rehabilitate.</li> <li>• Industrial land use designations and regulations vary between jurisdictions.</li> </ul>	
<p><b>Transportation Infrastructure</b></p> <ul style="list-style-type: none"> <li>• Highway accessibility - road</li> <li>• Water accessibility</li> <li>• Railroad service</li> <li>• Accessibility to major airport</li> <li>• Inbound/outbound shipping costs</li> </ul>	<ul style="list-style-type: none"> <li>• The Northern Waterfront is primarily served by SR-4, which connects with I-680 in central Contra Costa County and I-80 in west Contra Costa County. There is direct surface road access to SR-4 from the industrial areas, which connects the area to the interstate highway system.</li> <li>• Channel has a 35-foot depth, and there is water front access and several marine terminals. The Port of Oakland, Oakland International Airport, San Francisco International Airport and San Jose International Airport are in close proximity.</li> <li>• The area is served by two Class I railroads (UP and BNSF).</li> <li>• The pipeline system in the area is extensive.</li> </ul>	<ul style="list-style-type: none"> <li>• Traffic is extremely congested along SR-4 between Pittsburg and Brentwood. The benefits of the current expansion of SR-4 will be wiped out with the planned additional residential development in Brentwood, Antioch, Pittsburg, and the Concord Naval Weapons Station.</li> </ul>	

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**TABLE A2 (CONTINUED): Northern Waterfront Competitive Assessment**

<p><b>Utility Infrastructure</b></p> <ul style="list-style-type: none"> <li>• Availability and cost of utilities and public services</li> <li>• Water</li> <li>• Sewer</li> <li>• Power</li> <li>• Advanced ICT services</li> </ul>	<ul style="list-style-type: none"> <li>• Most of the area is located with an existing service district or their sphere of influence including:</li> <li>• Water supply is provided by the City of Antioch, CCWD, DWD, and EBMUD.</li> <li>• Wastewater is supplied by Delta Diablo Sanitation District, Central Sanitary District, Rodeo Sanitation District, and Hercules.</li> <li>• Power and gas are provided by PG&amp;E.</li> <li>• Major trunk lines for high speed broadband are located within the area.</li> </ul>	<ul style="list-style-type: none"> <li>• Many parcels are not served by advanced telecommunications. Some parcels require utility extensions or annexation into a service district.</li> </ul>	<p>Internal Factors</p>
<p><b>Labor</b></p> <ul style="list-style-type: none"> <li>• Availability of Skilled Labor</li> <li>• Training programs</li> <li>• Labor costs</li> <li>• Availability of unskilled labor</li> <li>• Low union profile</li> <li>• Right-to-work state</li> <li>• Proximity to technical college/training</li> </ul>	<ul style="list-style-type: none"> <li>• Contra Costa County has a relatively well educated workforce with 38.7% of the population over age 25 having a Bachelor's Degree or better. Contra Costa ranks well above the national average and ranks 5th in the State in terms of the percentage of its population over 25 years of age with a Bachelor's Degree or higher.</li> <li>• The Process Technology (PTEC) Program at Los Medanos College provides students with the training needed for jobs in local chemical and refining industries.</li> <li>• Contra Costa College developed a new Forklift, Logistics, Operations and Warehouse (FLOW) training program to meet the demands of a rapidly growing warehouse job market in the East Bay.</li> <li>• There is access to an experienced workforce.</li> <li>• There is a strong concentration of skilled labor within the local East Bay labor market area.</li> </ul>	<ul style="list-style-type: none"> <li>• Contra Costa labor costs are among the highest in the State. Mean hourly wages for production occupations are \$19.67 per hour versus a statewide average of \$16.72; Silicon Valley is \$19.09; southern California is \$17.27; and Fresno is \$14.53.</li> <li>• 7.8% of the Contra Costa's workforce is employed in production, transportation, and material moving occupations compared to the statewide average of 11.1%.</li> <li>• There are a limited number of training programs targeting jobs in the manufacturing sector located in Contra Costa County. Companies with large manufacturing operations in Contra Costa have been going out of state to find the skilled entry-level workers they need. Many of these companies are facing a serious shortage of trained employees because a large number of workers are reaching retirement age.</li> <li>• Employment in the transportation and warehouse industry category has been in decline.</li> <li>• Industries that are looking to expand in or relocate to the Northern Waterfront require a skilled workforce, often with specialized skills. Local governments may not be willing to invest sufficiently in job training programs that raise the skill level of the workforce to fulfill the demands of the various jobs.</li> </ul>	
<p><b>Financial Incentives</b></p> <ul style="list-style-type: none"> <li>• State and local incentives</li> <li>• Corporate tax rate</li> <li>• Tax exemptions</li> <li>• Availability of long-term financing</li> </ul>	<ul style="list-style-type: none"> <li>• Recycling market development program encourages qualifying manufacturers to utilize recycled feedstock or incorporate waste reducing practices in Recycling Market Development Zone (RMDZ) area. Low-interest loans, permitting assistance and business development assistance are available. The Contra Costa County RMDZ follows the Industrial Shoreline of the County.</li> <li>• A statewide Business Incentives Program managed through the Governor's Office of Business and Economic Development (GO-Biz) will replace enterprise zones including the Pittsburg-Bay Point Enterprise Zone. Statewide incentives include a sales and use tax exemption for manufacturing equipment and biotech R&amp;D, a long-term unemployed tax credit for areas of high unemployment and poverty, and a recruitment and retention incentive will be available to attract new companies to California and expand existing companies.</li> </ul>	<ul style="list-style-type: none"> <li>• Corporations looking to relocate or establish a business in the Northern Waterfront will pay among the highest state corporate tax rates in the country according to the Tax Foundation. Nationally, only eight states have a higher top corporate tax rate than California. The Tax Foundation's 2013 edition of the State Business Tax Climate Index ranked California 48th overall.</li> <li>• The statewide business incentive program does not provide a local competitive advantage for the Northern Waterfront.</li> </ul>	

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**TABLE A2 (CONTINUED): Northern Waterfront Competitive Assessment**

<p><b>Business Climate</b></p> <ul style="list-style-type: none"> <li>• Public policy/regulatory environment</li> <li>• Environmental regulations</li> <li>• Expedited or fast-track permitting</li> </ul>	<ul style="list-style-type: none"> <li>• The East Contra Costa County Habitat Conservation Plan provides a framework to protect natural resources in eastern Contra Costa County, while improving and streamlining the environmental permitting process for impacts on endangered species. The Plan will allow participating jurisdictions to control endangered species permitting for activities and projects in the region over which they have approval authority. The Plan avoids project-by-project permitting that is generally costly and time consuming for applicants and often results in uncoordinated and biologically ineffective mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>• According to a California Manufacturers and Technology Association survey, 82% percent of the companies, when expanding or opening a new facility do not consider California because of state policies that highly impacted their business. These include a costly and complicated tax system, poor regulatory environment, high labor costs, and a lack of financial incentives and tax credits.</li> <li>• There is lack of consensus or vision for future development of the Northern Waterfront among regional policy-makers.</li> <li>• Reduced city staffing due to budgetary constraints results in longer timeframes for approval and a poor attitude within staff.</li> <li>• Increasing amounts of regulatory compliance issues negatively impact companies.</li> </ul>	<p>Internal Factors</p>
Indicator	Opportunities	Threats	
<p><b>Underutilized/Vacant Land</b></p>	<ul style="list-style-type: none"> <li>• Industrial real estate market has been slowly improving since the 2007 recession with available space and low rental rates.</li> </ul>	<ul style="list-style-type: none"> <li>• Rental rates and demand are weak with competitive locations throughout the Bay Area.</li> </ul>	
<p><b>Relatively Affordable Space</b></p>	<ul style="list-style-type: none"> <li>• Space is available with low rents, which provide opportunities in advanced manufacturing, warehousing and storage, and logistics and distribution.</li> </ul>	<ul style="list-style-type: none"> <li>• Current rent levels do not support new development.</li> </ul>	
<p><b>Presence of Other Industrial Users</b></p>	<ul style="list-style-type: none"> <li>• Industry clusters with a variety of companies in several manufacturing subsectors are present in the area. Critical mass is a powerful force and provides synergies between businesses. As more companies locate in the Northern Waterfront, it will become more attractive to others.</li> <li>• Manufacturing is a core component of the local economy. Building upon existing strengths in products such as fabricated metals, printing and business forms will provide synergies to advanced manufacturing firms looking to expand or relocate. These synergies include economies of scale and industry cluster effects that can substantially reduce a company's costs and improve its productivity.</li> </ul>		<p>External Factors</p>
<p><b>Competitive Locations</b></p>	<ul style="list-style-type: none"> <li>• The Northern Waterfront with its deep-water channels and marine terminals, proximity to two Class I railroad lines, electric generating capacity, industrial zoned land, and existing cluster of industrial firms provides opportunities to attract manufacturing firms that need these features.</li> </ul>	<ul style="list-style-type: none"> <li>• Other competitive sites and locations can be found around the Bay Area. Competitive development locations include Mare Island in Vallejo, Alameda Naval Air Station in Alameda,; and the former Oakland Army Base in Oakland currently being redeveloped.</li> <li>• There is global competition for industrial attraction. Economic development organizations in Contra Costa County have not taken a lead role in addressing the long-term opportunities for industrial development.</li> </ul>	
<p><b>Government Policies</b></p>		<ul style="list-style-type: none"> <li>• Regional Smart Growth policies intensify development pressures on goods movement industries. These forces are affecting the efficiency of the freight transportation system in the Bay Area and raising important economic, transportation, and land use policy issues. Industrial lands in the Northern Waterfront face similar pressures. As industrial lands get converted to other uses, the remaining sites become more valuable.</li> </ul>	

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**TABLE A2 (CONTINUED): Northern Waterfront Competitive Assessment**

<p><b>Traffic and Roadway Conditions</b></p>		<ul style="list-style-type: none"> <li>• Congestion on regional roads and highways will likely increase in the future without substantial state and local investment in existing infrastructure and/or construction of new facilities to increase system capacity and redundancy.</li> <li>• The State's financial problems could have a long-term impact on local finances and public investment.</li> </ul>	<p>External Factors</p>
<p><b>Goods Movement Infrastructure</b></p>	<ul style="list-style-type: none"> <li>• Congestion on area roads and highways will favor industries in the Northern Waterfront that can move raw materials, production inputs, and finished goods by water or rail.</li> </ul>	<ul style="list-style-type: none"> <li>• Railroads may not desire to provide access and services to new facilities.</li> <li>• The channel depth of the Northern Waterfront will not be able to accommodate the increasingly larger mega vessels ocean carriers are deploying. The Army Corps of Engineers may not support dredging to deeper depths and/or the funding may not be appropriated by Congress.</li> <li>• Transportation facilities in neighboring communities are more developed. Neighboring San Joaquin County has a direct link to the Bay Area along I-580, which has led to a higher concentration of distribution and logistics activity there. San Joaquin County also has facilities for intermodal truck-to-rail container transfers, and an airport capable of handling large cargo planes and commercial flights.</li> </ul>	
<p><b>Global and Regional Economic Trends</b></p>	<ul style="list-style-type: none"> <li>• The reshoring trend of manufacturing industries returning from offshore to the U.S. could bring some businesses to the area.</li> </ul>	<ul style="list-style-type: none"> <li>• Trends such as globalization of supply chains, mass customization, shortening of product lifecycles, low inventory, and quick response requirements makes industry more dependent on efficient goods movement infrastructure and services.</li> <li>• Manufacturing innovations will displace many of today's traditional manufacturing processes, replacing labor-intensive manufacturing processes with automated processes. Businesses in the area may not be sufficiently prepared.</li> <li>• Economic development organizations in the County have not taken a lead role in addressing the long-term opportunities. If neighboring regions are aggressive, these areas may attract a greater share of new business.</li> </ul>	
<p><b>Foreign Trade Zone (FTZ) #3</b></p>	<ul style="list-style-type: none"> <li>• Goods brought into a FTZ or sub-zone may be stored, manipulated or mixed with domestic or foreign materials used in manufacturing processes or exhibited for sale. Anything shipped out of a FTZ into the U.S. customs territory is then subject to duties. Goods reshipped to foreign nations are never subject to U.S. customs duties. Use of the FTZ #3 could benefit importers in the Northern Waterfront.</li> </ul>		

Source: Consultant Team analysis

**TABLE A3: Description of Port Facilities in the Northern Waterfront**

Port Facility/ Location	Port Name	Owner/Operator	Purpose of Facility	Commodities Handled	Berthing Distance/ Depth
<b>Conoco Phillips Oil Refinery</b> Marine Terminal Rodeo		Conoco Phillips	Receipt of crude oil and shipment of refined petroleum products; occasional bunkering of vessels	<ul style="list-style-type: none"> <li>• Petroleum and Petroleum Products</li> <li>• Crude Petroleum</li> <li>• Gasoline, Jet Fuel, Kerosene</li> <li>• Distillate, Residual &amp; Other Fuel Oils</li> <li>• Lube Oil &amp; Greases</li> </ul>	2,517 feet
<b>Nustar Energy</b> Crockett Terminal Selby		Carquinez Strait	Receipt and shipment of petroleum products	<ul style="list-style-type: none"> <li>• Petroleum and Petroleum Products</li> <li>• Crude Petroleum</li> <li>• Gasoline, Jet Fuel, Kerosene</li> <li>• Distillate, Residual &amp; Other Fuel Oils</li> <li>• Lube Oil &amp; Greases</li> </ul>	850 feet
<b>C&amp;H Sugar Company</b> Berths 1 Through 5 Crockett		California & Hawaii Sugar Company	Receipt of unrefined sugar and plant supplies; occasional shipment of packaged refined sugar	<ul style="list-style-type: none"> <li>• Other Agricultural Products; Food and Kindred Products</li> </ul>	2,815 feet
<b>Shell Martinez Marine Terminal</b> Martinez Refinery Wharf Martinez		Carquinez Strait	Receipt and shipment of crude oil and petroleum products	<ul style="list-style-type: none"> <li>• Petroleum and Petroleum Products</li> <li>• Gasoline, Jet Fuel, Kerosene</li> <li>• Distillate, Residual &amp; Other Fuel Oils</li> <li>• Lube Oil &amp; Greases</li> </ul>	2,624 feet
<b>Tesoro Amorcó Marine Terminal</b> Martinez		Tesoro Refining and Marketing Company	Import facility for crude oil serving the Golden Eagle Refinery	<ul style="list-style-type: none"> <li>• Crude Petroleum</li> <li>• Petroleum and Petroleum Products</li> </ul>	982 feet
<b>Pacific Atlantic Terminals</b> Martinez		Suisun Bay Channel	Receipt and shipment of crude oil and petroleum products	<ul style="list-style-type: none"> <li>• Petroleum and Petroleum Products</li> <li>• Gasoline, Jet Fuel, Kerosene</li> <li>• Distillate, Residual &amp; Other Fuel Oils</li> <li>• Lube Oil &amp; Greases</li> </ul>	1,000 feet
<b>Tesoro Amorcó Marine Terminal</b> Martinez		Tesoro Refining and Marketing Company	Receipt and shipment of petroleum products by tanker and barge	<ul style="list-style-type: none"> <li>• Petroleum and Petroleum Products</li> <li>• Crude Petroleum</li> </ul>	350 feet
<b>Bay Area Bulk Terminal</b> Pittsburg		Koch Carbon, Inc.		<ul style="list-style-type: none"> <li>• Petroleum Pitches, Coke, Asphalt, Naptha and Solvents</li> </ul>	750 feet
<b>USS-Posco Industries</b> Pittsburg Wharf Pittsburg		USS-Posco Industries	Receipt of semi-finished steel by vessel and barge	<ul style="list-style-type: none"> <li>• Primary Iron and Steel Products (Ingots, Bars, Rods, etc.)</li> <li>• Primary Non-Ferrous Metal Products</li> <li>• Fabricated Metal Prods</li> </ul>	891 feet
<b>Dow Chemical Co</b> Pittsburg Plant Wharf Pittsburg		New York Slough	Receipt and shipment of caustic soda	<ul style="list-style-type: none"> <li>• Other Chemicals and Related Products</li> </ul>	672 feet
<b>Fulton Shipyard Pier</b> Antioch		San Joaquin River	Mooring vessels for conversion, outfitting, and repair	<ul style="list-style-type: none"> <li>• Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material</li> </ul>	525 feet
<b>Georgia-Pacific Corp</b> Antioch Plant Wharf Antioch		San Joaquin River	Receipt of gypsum rock by self-unloading vessel	<ul style="list-style-type: none"> <li>• Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material</li> </ul>	780 feet

(CONTINUED NEXT PAGE)

**TABLE A3 (CONTINUED): Description of Port Facilities in the Northern Waterfront**

Port Facility/ Location	Port Name	Owner/Operator	Purpose of Facility	Commodities Handled	Berthing Distance/ Depth
Forestar Dock Antioch	Sacramento, Stockton	San Joaquin River	Receipt of gypsum rock by self-unloading vessel	<ul style="list-style-type: none"> <li>Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material</li> </ul>	780 feet
<b>Contra Costa Power Plant</b> Antioch		NRG			150 feet
<b>Kie-Con Kiewit Wharf</b> Antioch		Kiewit Pacific			
<b>Diablo Service Corp</b> Pittsburg Wharf Pittsburg		San Joaquin River	Receipt of caustic soda by barge; shipment of petroleum coke by vessel	<ul style="list-style-type: none"> <li>Coal, Lignite &amp; Coal Coke</li> <li>Gasoline, Jet Fuel, Kerosene</li> <li>Distillate, Residual &amp; Other Fuel Oils; Lube Oil &amp; Greases</li> <li>Petroleum Pitches, Coke, Asphalt, Naptha and Solvents</li> </ul>	1,154 feet
<b>Pacific Gas &amp; Electric Co Delta Power Plant Wharf Pittsburg</b>		San Joaquin River	Occasional receipt of fuel oil by tanker, occasional shipment by barge	<ul style="list-style-type: none"> <li>Gasoline, Jet Fuel, Kerosene</li> <li>Distillate, Residual &amp; Other Fuel Oils</li> <li>Lube Oil &amp; Greases</li> </ul>	1,224 feet
<b>Anchorage 27</b> Pittsburg		Suisun Bay Channel		<ul style="list-style-type: none"> <li>Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material</li> </ul>	
<b>Pittsburg</b> Pittsburg		San Joaquin River		<ul style="list-style-type: none"> <li>All Manufactured Equipment, Machinery and Products</li> </ul>	

**TABLE A4: Physical Characteristics of Maritime Facilities in the Northern Waterfront**

Name of the Marine Terminal	Commodities Handled/ Purpose of Facility	Berthing Distance (Largest/Total)	Depth (Min/Max)	Deck Height (Min/Max)
Conoco Phillips - Rodeo Oil Refinery Port	Receipt and shipment of crude oil and petroleum products; occasional bunkering of vessels.	1,375 ft / 2,517 ft	20 ft / 40 ft	17 ft / 17 ft
Shore Terminals, LLC. Selby Marine Terminal	Mooring tugs and small craft	545 ft / 545 ft	13 ft / 30 ft	9 ft / 9 ft
Nustar Energy, Crockett Terminal Port Facility	Receipt and shipment of crude oil and petroleum products; occasional bunkering of vessels.	N/A	N/A	N/A
California and Hawaiian Sugar Co Port Facility	Receipt of unrefined sugar and plant supplies; occasional shipment of packaged refined sugar.	2,815 ft / 2,815 ft	33 ft / 34 ft	12 ft / 12 ft
Defense Fuel Supply Center Ozol Wharf Port Facility	Not Used Currently.	880 ft / 880 ft	40 ft / 40 ft	8 ft / 8 ft
Martinez Refining Co Martinez Refinery Wharf Port Facility	Receipt and shipment of crude oil and petroleum products.	750 ft / 2,624 ft	45 ft / 45 ft	15 ft / 15 ft
Tosco Refining Co., San Francisco Area Refinery at Avon, Amarco Lower Wharf. Port Facility	Not Used Currently.	982 ft / 982 ft	40 ft / 40 ft	15 ft / 15 ft
Pacific Atlantic Terminals Port Facility	Receipt and shipment of crude oil and petroleum products.	1,000 ft / 1,000 ft	40 ft / 40 ft	17 ft / 17 ft
Tosco Refining Co., San Francisco Area Refinery at Avon, Barge Wharf. Port Facility	Shipment of petroleum products by barge.	350 ft / 350 ft	18 ft / 18 ft	19 ft / 19 ft
Pacific Gas & Electric Co Delta Power Plant Wharf Port Facility	Occasional receipt of fuel oil by tanker, occasional shipment by barge.	1,070 ft / 1,224 ft	23 ft / 23 ft	14 ft / 14 ft
Diablo Service Corp Pittsburg Wharf Port Facility	Receipt of caustic soda by barge; shipment of petroleum coke by vessel.	1,154 ft / 1,154 ft	35 ft / 35 ft	12 ft / 12 ft
USS-Posco Industries, Pittsburg Dock. Port Facility	Occasional mooring of tugboats.	400 ft / 400 ft	25 ft / 25 ft	13.5 ft / 13.5 ft
Dow Chemical Co Pittsburg Plant Wharf Port Facility	Receipt and shipment of caustic soda.	672 ft / 672 ft	40 ft / 40 ft	20 ft / 20 ft
Fulton Shipyard Pier Port Facility	Mooring vessels for conversion, outfitting, and repair.	525 ft / 525 ft	16 ft / 16 ft	14 ft / 14 ft
Georgia-pacific Corp Antioch Plant Wharf Port Facility	Receipt of gypsum rock by self-unloading vessel.	780 ft / 780 ft	31 ft / 31 ft	11 ft / 11 ft
Gaylord Container Corp., California Mill Wharf. Port Facility	Receipt of miscellaneous dry bulk commodities.	N/A	N/A	N/A

Source: <http://seaport.findthedata.org>

**TABLE A5: Average Floor Area Per Employee By Manufacturing Subsector**

NAICS Code	Industry Sector	Enclosed Floor Area <sup>1</sup> (million sq ft)	Number of Employees <sup>2</sup>	Floor Area Per Employee <sup>3</sup>	Number of Establishments <sup>1</sup>	Average Floor Area Per Establishment <sup>3</sup>
311	Food Products	751.0	1,532,478	490	15,089	49,771
312	Beverage Products	181.0	205,816	879	1,517	119,314
313	Textile mills	253.0	291,642	868	2,247	112,595
314	Textile product mills	225.0	194,385	1,157	3,457	65,085
315	Apparel and other textile products	111.0	354,454	313	5,500	20,182
316	Leather and leather products	34.0	49,636	685	685	49,635
321	Lumber and wood products	445.0	553,919	803	10,486	42,438
322	Paper and allied products	580.0	543,379	1,067	4,257	136,246
323	Printing and publishing	433.0	707,566	612	20,220	21,414
324	Petroleum and coal products	78.0	118,669	657	1,916	40,710
325	Chemicals and allied products	672.0	924,737	727	8,909	75,429
3254	Pharmaceuticals and Medicines	169.0			1,143	161,532
326	Plastic and Rubber products	767.0	846,766	906	10,538	72,784
327	Stone, clay, glass, and concrete prod	501.0	517,217	969	11,593	43,216
331	Primary metal	550.0	506,678	1,086	4,166	132,021
332	Fabricated metal products	1,277.0	1,540,867	829	35,349	36,125
333	Machinery and equipment	825.0	1,221,816	675	17,381	47,466
334	Computer & Electronic Products	665.0	1,498,244	444	9,238	71,985
335	Electrical equipment and appliances	309.0	494,201	625	3,886	79,516
336	Transportation equipment	1,111.0	1,820,170	610	7,653	145,172
337	Furniture and fixtures	473.0	601,929	786	10,941	43,232
3391	Medical equipment and supplies					
339	Misc. manufacturing industries	400.0	684,625	584	15,605	25,633
	<b>Total</b>	<b>10,641.0</b>	<b>15,209,194</b>	<b>700</b>	<b>200,711</b>	<b>53,017</b>

Source:

1. Energy Information Administration, Office of Energy Markets and End Use, Energy Consumption Division, Form EIA-846, "2002 Manufacturing Energy Consumption Survey", Table 9.1: Enclosed Floor space and Number of Establishment Buildings

2. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2002

3. Craft Consulting Group calculations

**TABLE A6: National Average Space Utilization per Employee by Manufacturing Subsector**

	Square Feet Per Employee		
	1998	2002	2006
Food Manufacturing	515	483	567
Beverage and Tobacco Product	990	874	1273
Textile Mills and Textile Product Mills	887	787	1552
Apparel Manufacturing	534	230	704
Leather and Allied Product Manufacturing	568	495	755
Wood Product Manufacturing	617	726	1091
Paper Manufacturing	994	959	1132
Printing and Related Support Activities	517	537	836
Petroleum and Coal Products Manufacturing	714	633	570
Chemical Manufacturing	1262	685	870
Plastics and Rubber Products Manufacturing	899	807	1218
Nonmetallic Mineral Product Manufacturing	785	904	973
Primary Metal Manufacturing	965	885	1306
Fabricated Metal Product Manufacturing	757	729	964
Machinery Manufacturing	708	566	860
Computer and Electronic Product Manufacturing	360	365	429
Electrical Equipment, Appliance, and Component Manufacturing	2285	523	821
Transportation Equipment Manufacturing	544	540	999
Furniture and Related Product Manufacturing	715	693	1558
Miscellaneous Manufacturing	569	550	719
Manufacturing	744	617	892

Source: Energy Information Agency (EIA), Manufacturing Energy Consumption Survey (MECS),  
Regional Plan Association (RPA) Calculations

**TABLE A7: Bay Area Economic Profile**

			Employment Concentration (National LQ)		
NAICS Code	Industry Description	Bay Area Employment	Bay Area	Contra Costa	Northern Waterfront
11	Agriculture, forestry, fishing and hunting	19,140	0.62	0.26	0.17
21	Mining, quarrying, and oil and gas extraction	1,912	0.09	0.53	0.38
22	Utilities	7,096	0.50	1.86	1.95
23	Construction	140,258	0.97	1.33	1.56
31-33	Manufacturing	311,594	1.01	0.58	2.20
42	Wholesale trade	116,884	0.80	0.57	0.63
44-45	Retail trade	321,701	0.84	1.10	0.73
54	Professional and technical services	362,677	1.78	1.21	1.31
55	Management of companies and enterprises	62,843	1.21	1.09	0.44
56	Administrative and waste services	179,981	0.87	0.92	0.18
61	Educational services	86,471	1.28	1.02	0.64
62	Health care and social assistance	331,649	0.76	1.03	0.36
48-49	Transportation and warehousing	68,995	0.64	0.50	0.01
51	Information	122,044	1.76	1.25	1.78
52	Finance and insurance	121,324	0.84	1.36	0.65
53	Real estate and rental and leasing	54,271	1.08	1.29	2.42
71	Arts, entertainment, and recreation	54,903	1.07	1.18	0.48
72	Accommodation and food services	297,399	0.98	0.94	0.36
81	Other services	173,143	1.47	1.49	1.75
92	Government	450,700			
<b>Total, all industries</b>		<b>3,310,952</b>			

Source: Bureau of Labor Statistics, ESRI, California Employment Development Department

**TABLE A8: Examples of Industries Based on Value Added and Capital Intensity**

	<b>Capital Intensive Industries</b>	<b>Labor Intensive Industries</b>
High Value-Added Industries	<ul style="list-style-type: none"><li>• Chemicals</li><li>• Petroleum Refining</li><li>• Electronics</li><li>• Biomedical</li></ul>	<ul style="list-style-type: none"><li>• Metal Products</li><li>• Transportation Vehicles and Equipment</li><li>• Food and Beverage</li><li>• Machinery</li><li>• Electrical Equipment</li></ul>
Low Value-Added Industries	<ul style="list-style-type: none"><li>• Plastic and Rubber Products</li><li>• Lumber and Wood Products</li><li>• Building Materials</li><li>• Publishing/Printing/Reproduction</li><li>• Paper</li></ul>	<ul style="list-style-type: none"><li>• Textiles</li><li>• Apparel</li><li>• Leather</li><li>• Footwear</li><li>• Jewelry</li></ul>

**TABLE A9: Industrial Zoning**

	<b>Hercules</b>	<b>Martinez</b>	<b>Concord</b>	<b>Pittsburg</b>	<b>Antioch</b>	<b>Oakley</b>	<b>County</b>
Industrial Land Use Designation	Industrial (I)	Light Industrial (LI), Heavy Industrial (HI), Controlled Industrial (CI)	Office Business Park (OBP), Industrial Business Park (IBP), Industrial Mixed Use (IMU), Heavy Industrial (HI)	Limited Industrial (LI), Industrial Park (IP), General Industrial (GI)	Light Industrial (M-1), Heavy Industrial (M-2)	Light Industrial (LI)	Controlled Manufacturing (CM), Light Industrial (LI), Controlled Heavy Industrial (W3), Heavy Industrial (HI)
Permitted Users	List of Uses (Permitted, Conditional, Temporary). Non-industrial activities and uses allowed including commercial, public, and limited residential.	List of manufacturing uses with limited non-industrial activities and uses.	List of Uses (Permitted, Conditional, Temporary). Non-industrial activities and uses allowed including commercial, retail, residential, public, and recreational uses.	List of Uses (Permitted, Conditional, Temporary) includes non-industrial activities and uses.	List of uses includes non-industrial activities and uses requiring administrative or use permit.	List of Uses (Permitted, Conditional) included non-industrial activities and uses.	List of Uses (Permitted, Conditional, Temporary) includes non-industrial activities and uses.
Sit Coverage	50%	50%		50%, 60%, 75%	50%	50%	50%
Building Heights	1-2 stories: 35ft	30ft or higher with conditional use permit.	36ft; 50ft	37ft; 50ft	45ft; 70ft	3 stories or 50ft	35ft or higher depending on district.
FAR(building floor area per lot area)	0.30 to 0.50		0.60; 0.80; 1.00	0.8		.067	
<b>Setbacks</b> Front Side Rear	25ft 25ft 25ft	10 - 100ft 10 - 150ft	Varies 15 to 40ft 10ft for OBP, 0 for inertial 10ft for OBP, 0 for inertial	25ft 10ft 10ft or 0		10ft 10ft 0	10 - 20ft 20ft 20ft
Abutting Residential or Commercial		Setback vary depending on adjacent use.	Varies 15 to 50ft	10ft		20ft	
Performance Standards	New uses that generate substantial odor, water quality, air quality, public safety, toxic or hazardous impacts are prohibited.	Compliance with all required regional water and air quality and health department standards.	Performance standards for all new and existing land uses to minimize operational impacts and promote compatibility with adjoining areas and uses.	Requirements for combustibles, explosives, electromagnetic interference, glare, heat and humidity, noise, odors, and property maintenance. Compliance with regional air quality regulations.	Compliance with Hazardous Materials Ordinance.	Uses which emit dust, smoke, fumes, noise, vibrations, brilliant light, or are otherwise offensive to the sense or are a kind of quality that their operation interferes with development or enjoyment of other property in the vicinity.	Compliance with Hazardous Materials Ordinance.
Permit Required	Hazardous materials management plan required. Administrative or Conditional Use Permit		Zoning clearance for compliance.	Use permit may be required.	Hazardous materials management plan required. Use permit may be required.	Conditional use permit required for most manufacturing uses and activities.	Land Use Permit
Design Review	Yes		Yes	Yes	Yes	Yes	

Source: City/County Zoning Ordinances

**TABLE A10: Goods Movement Infrastructure Improvement Projects (Planned and Proposed)**

Maritime Improvement Projects	
1.	<p><b>Suisun Bay Channel - Operations and Maintenance Project</b>                      This project provides for annual maintenance dredging of the Suisun Bay Channel to maintain a channel 300 feet wide and -35 feet deep from the Carquinez Strait at Martinez to Pittsburg. Under this project the dredging continues further upstream to Antioch through the New York Slough Channel, a distance of almost 17 miles.</p>
2.	<p><b>Concord Naval Weapons Station Channel Deepening</b>                      USACE has been tasked with the evaluation and potential construction of a deep draft navigation channel (-42 feet MLLW) to accommodate the current and future fleet of container ships. Design and construction are contingent upon modeling results and testing to determine impacts</p>
3.	<p><b>San Francisco-toStockton (Suisun Bay/New York Slough) Maintenance Assessment District</b>                      Two phases of this project have already been implemented. Implementation of an additional phase, consisting of deepening the main channel in Suisun Bay to -45 feet MLLW, and providing a maneuvering area for a petroleum terminal and a turning basin at Avon, is delayed pending analysis of environmental impact concerns to the Delta.”</p>

Source: U.S. Army Corps of Engineers

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**TABLE A10 (CONTINUED): Highway Transportation Projects for Study Area**

RTP ID	Project Title
21205	Improve I-680/Route 4 interchange (includes connecting northbound I-680 to westbound State Route 4, connecting eastbound State Route 4 to southbound I-680, and widening SR-4 between Morello and SR-242)
21214	Widen Wilbur Avenue over Burlington Northern Santa Fe Railroad from 2 lanes to 4 lanes
22350	Improve I-680/Route 4 interchange Phases 4 and 5 (includes connecting southbound I-680 to eastbound State Route 4, connecting westbound State Route 4 to northbound I-680, and constructing HOV flyover ramps from westbound State Route 4 to I-680 southbound from I-680 northbound to eastbound State Route 4)
22352	Construct Direct Access Ramps along I-680 in the vicinity of Norris Canyon Road
22390	Reconstruct State Route 4/Willow Pass Road ramps in Concord
22400	Conduct environmental and design studies to create a new alignment for SR239 and develop corridor improvements from Brentwood to Tracy - project development
22602	Construct auxiliary lane on I-680 in both directions between Sycamore Valley Road in Danville to Crow Canyon Road in San Ramon
22604	Improve safety and operations of Vasco Road from Brentwood to Alameda County line - Phase 2 (includes potential realignment)
22607	Widen and extend major streets, and improve interchanges in east Contra Costa County
22610	Widen and extend major streets, and improve interchanges in west Contra Costa County
94046	Improve interchanges and parallel arterials to Route 4
94048	Improve interchanges and parallel arterials to I-80
98115	Widen Ygnacio Valley/Kirker Pass Roads from 4 lanes to 6 lanes from Michigan Boulevard to Cowell Road
98126	Improve interchanges and arterials parallel to I-680 and Route 24
98133	Widen Pacheco Boulevard from 2 lanes to 4 lanes between Blum Road to Arthur Road
98198	Improve safety and operations on Vasco Road in Contra Costa and Alameda counties
98222	Construct freeway-to-freeway direct connectors between Route 4 Bypass and Route 160
98999	Widen Route 4 from Somersville Road to Route 160 including improvements to interchanges
230202	Widen Route 4 Bypass from 2 to 4 Lanes from Laurel Road to Sand Creek Road
230203	Construct Route 4 Bypass interchange at Sand Creek Road
230205	Widen Route 4 Bypass from 2 to 4 lanes from Sand Creek Road to Balfour Road
230206	Construct Route 4 Bypass interchange at Balfour Road (Phase 1)
230236	Widen Pittsburg-Antioch Highway from 2 lanes to 4 lanes
230249	Construct grade separation underpass at Lone Tree Way and Union Pacific Railroad
230274	Widen Main Street to 6 lanes from Route 160 to Big Break Road
230291	Construct northbound truck climbing lane from Clearbrook Drive in Concord to crest of Kirker Pass Road, includes 12-foot dedicated truck climbing lane, bike lane and 8-foot paved shoulder
230306	Improve safety on Alhambra Avenue by adding second southbound lane from Walnut Avenue to south side of State Route 4, includes signal modifications
230538	Widen Bailey Road lanes and shoulders
230597	Implement I-80 Integrated Corridor Mobility Project (includes the installation/upgrade of corridor management elements along the I-80 corridor (Phase 1) and along parallel and connecting arterials (Phase 2) to allow sharing of real-time traveler information among public agencies and the public)
230693	Local streets and roads operations and maintenance
240355	Add an eastbound mixed-flow lane on Route 4 from the lane drop 1,500 feet west of Port Chicago Highway to east of Willow Pass Road (west) on-ramp
240624	Implement I-80 Integrated Corridor Mobility (ICM) Project Operations and Management - Local Portion – Maintenance

Source: MTC Regional Transportation Program

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**TABLE A10 (CONTINUED)**

Road Infrastructure and Operational Issues	
1.	Hercules – John Muir Parkway / Alfred Nobel Drive: The roadways connect an industrial park that houses business units such as the Hercules Business Center, Bio-Rad, a life sciences company, and a few other businesses to SR-4 freeway; and is in excellent condition. With the development of proposed intermodal transit center (ITC), the area is likely to see growth and strong commercial space development. On the ramp connecting John Muir Parkway to SR-4 freeway, there is low clearance due to a height restriction of 14’3” as seen in the photo below. Similarly, there is low clearance due to height restriction of 14’9” on Sycamore Avenue due to a multilevel grade separation with the railroad bridge and I-80 bridge structure, very close to the intersection of Willow Avenue and Sycamore Avenue. Although Caltrans considers a legal truck to be limited to 14 feet, these low clearance situations could result in unsafe conditions for trucks.
2.	Rodeo – San Pablo Avenue / Cummings Skyway: The roadways connect the businesses of Phillips 66 Rodeo Refinery, Air Liquide - Rodeo Hydrogen Plant and NuStar marine oil terminal and storage facilities to I-80. As shown in Figure XX below, the ride quality on San Pablo Avenue can be improved; currently the road surface is slightly uneven, likely due to the impact loads of the oil carrying trucks. Oil pipelines cross over San Pablo Avenue providing a vertical clearance of 16 feet. Cummings Skyway is a highly curvy and steep roadway used by industries both in Rodeo and Crockett to access SR-4, this roadway contains a long truck climbing lane. Cummings Skyway provides a vertical clearance of just 14’11” above SR-4 as seen from the photograph of the ramp below in Figure XX. The low clearance may result in unsafe conditions for trucks.
3.	Crockett – Dowrelia Drive / Wanda Street (Extension) / Pomona Street or Rolph Avenue / Crockett Boulevard / Cummings Skyway: The first set of roadways connects the businesses of California and Hawaiian Sugar Company to I-80, while the second set of roadways connects it to SR-4. Both sets of roadways are in very good condition. However, Crockett Boulevard like Cummings Skyway is a highly curvy and steep roadway but has a limited (small) section of truck passing lane. The issues identified earlier with Cummings Skyway also affect the access to the businesses in Crockett.
4.	SR-4 between east of Cummings Parkway and exits to City of Martinez: SR-4 in this section is a two-lane freeway in each direction, in the eastbound direction, a steep up grade is followed by a steep down grade. There are currently no additional truck passing lanes. Due to the grade, queues are sometimes developing in the traffic behind slow-moving trucks.
5.	Martinez – Shell Avenue / Marina Vista Avenue (west of Shell Avenue) / Alhambra Avenue and Shell Avenue / Marina Vista Avenue (east of Shell Avenue): The first set of roadways connects the businesses of Shell Refinery/Chemicals and other industries, Pacific Atlantic Marine Terminal to SR-4, while the second set of roadways connects them to I-680. Both sets of roadways are in very good condition. On Shell Avenue, there is low clearance, which may result in unsafe conditions for trucks. Berrellessa Street, Ferry Street, Marina and Vista Avenue have public at-grade crossings. In particular, Ferry Street connects Martinez Regional Shoreline Park with Martinez downtown.
6.	Near Martinez – Imhoff Drive / Solano Way / Arnold Industrial Way and Waterfront: The first set of roadways connects the business of Tesoro Amorco Marine Terminal & Golden Eagle Refinery to SR-4, while the second 7.roadway connects it to I-680. The roadways are in fair to good condition. On Imhoff Drive, there is a public at8.-grade crossing with a poor road surface.
7.	SR-9.4/I-680 interchange: The weaving distances on SR-4 at the interchange with I-680 appear to be short, and t10.he weaving traffic volumes in the eastbound direction are very high during the P.M. peak hours.
8.	Near Concord – Port Chicago Highway and Arnold Industrial Way: The roadway connects Military Ocean Terminal Concord (MOTCO) to SR-4. The condition of Port Chicago Highway leading to the military facility is excellent. There is an at-grade crossing on the roadway. Arnold Industrial Way, located near the Port Chicago Highway / SR-4 interchange holds several small-scale businesses and a plenty of commercial and storage space for rental.
9.	SR-4 between east of Port Chicago Highway and exits to City of Bay Point: SR-4 in this section is a three mixed lanes and one HOV-lane freeway in each direction, in the eastbound direction, a steep up grade is followed by a steep down grade. Due to the grade, trucks would move slow.
10	Pittsburg – Pittsburg-Antioch Highway / Railroad Avenue and Pittsburg-Antioch Highway / Loveridge Road: Both sets of roadways connect multiple industries including Dow Chemical Company, Koch Carbon Inc, USS Posco Industries, Air Liquide America Corp., Biozone Laboratories Inc (a pharmaceutical preparation manufacturing company), several metal processing and fabrication manufacturing (e.g., California Expanded Metals Co., CEMCO) and miscellaneous manufacturing companies to SR-4. The roadways are in fair to good condition. The traffic on SR-4 near the interchanges with Railroad Avenue and Loveridge Road is under jam condition in the eastbound direction during the P.M. peak hours. The particular intersection of Loveridge Road and Pittsburg-Antioch Highway is resulting in very long queues on Pittsburg-Antioch Highway, at this location, the highway consists of a single lane in each direction.
11.	Antioch – Wilbur Ave: The roadway connects a variety of businesses including Cemex, and Georgia Pacific Gypsum to SR-160. The roadways are in fair to good condition. The ride quality on SR-160 can be improved. The particular intersection of Loveridge Road and Pittsburg-Antioch Highway is resulting in very long queues on Pittsburg-Antioch Highway, at this location, the highway consists of a single lane in each direction.
12.	County-wide - SR-4 Widening: There are frequent disruptions in traffic in both eastbound and westbound directions due to narrow lanes and speed reductions at work zones for SR-4 widening.

**TABLE A10 (CONTINUED)**

<b>TriLink (SR 239) Feasibility Study</b>	
1.	Airport Connector between Vasco Road and the Byron Highway
2.	South Link (I-205) along the Byron Highway from the airport south to I-205 near Tracy
3.	North Link from SR-4 south of Brentwood to the Byron Highway north of the airport
4.	I-580 Link south from SR-4 to I-580 near Tracy
5.	Transit connection to existing or planned facilities and new bicycle facilities within the corridor

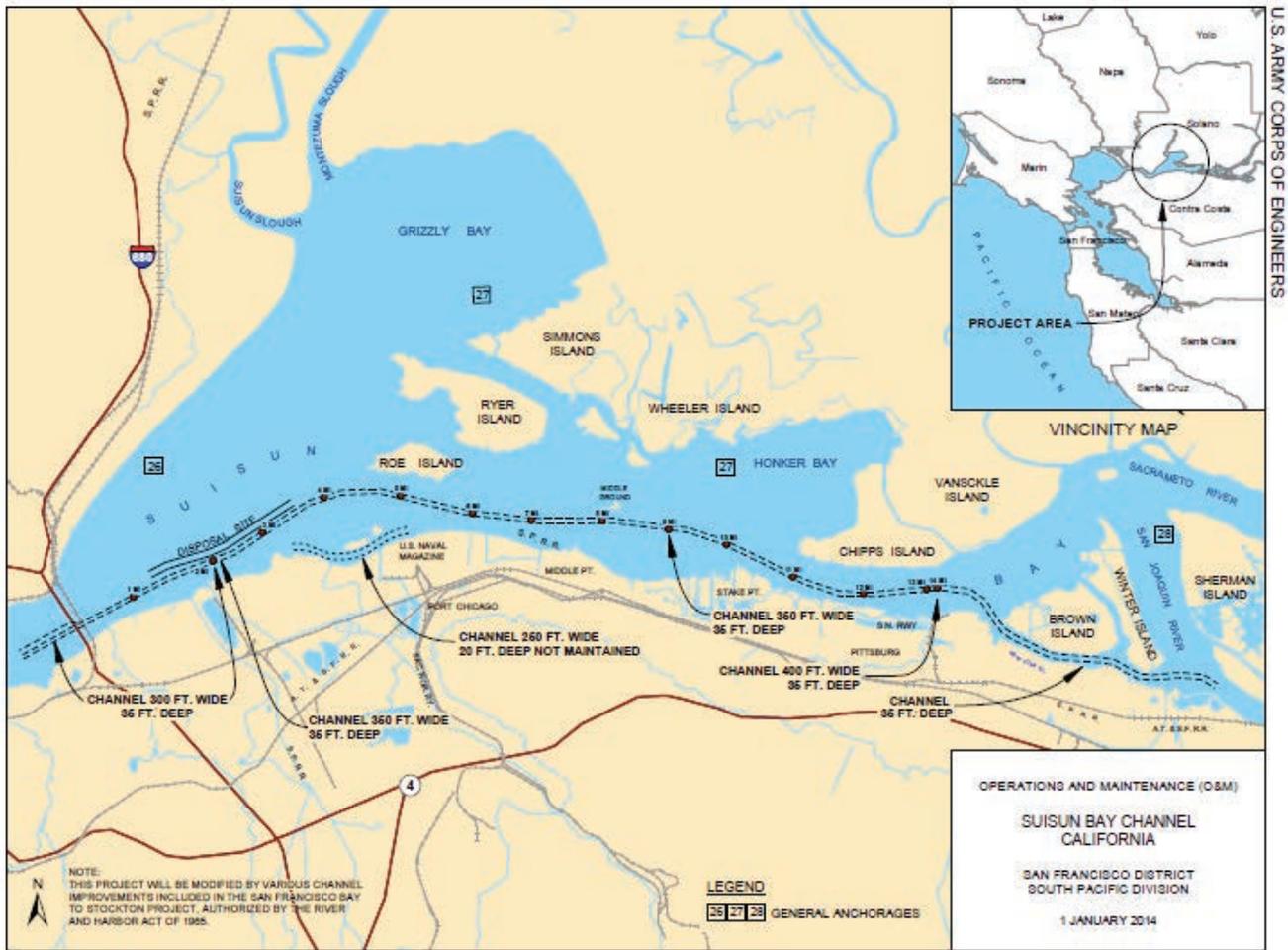
Source: Contra Costa Transportation Authority

**TABLE A11: Clean Technology Market Segments**

<b>1. Energy Generation</b>	<ul style="list-style-type: none"> <li>• Wind</li> <li>• Solar</li> <li>• Hydro</li> <li>• Marine (Tidal, Wave, Current)</li> </ul>	<ul style="list-style-type: none"> <li>• Biofuels</li> <li>• Geothermal</li> <li>• Waste-to-Energy</li> <li>• Other (Co-generation, Hydrogen)</li> </ul>	<ul style="list-style-type: none"> <li>• Equipment &amp; component parts (generators, controls, inverters, turbines, etc)</li> </ul>
<b>2. Energy Storage</b>	<ul style="list-style-type: none"> <li>• Fuel Cells</li> </ul>	<ul style="list-style-type: none"> <li>• Advanced Batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Hybrid Systems</li> </ul>
<b>3. Energy Infrastructure</b>	<ul style="list-style-type: none"> <li>• Advanced Batteries</li> <li>• Management</li> <li>• Transmission</li> </ul>	<ul style="list-style-type: none"> <li>• Controls</li> <li>• Integrated Electronic Systems for Management</li> </ul>	<ul style="list-style-type: none"> <li>• Smart Grid</li> </ul>
<b>4. Energy Efficiency</b>	<ul style="list-style-type: none"> <li>• Lighting</li> <li>• HVAC</li> <li>• Glass</li> </ul>	<ul style="list-style-type: none"> <li>• Sensors &amp; Diagnostic Equipment</li> <li>• Appliances</li> <li>• Motors, Machinery, Compressors</li> </ul>	<ul style="list-style-type: none"> <li>• Related Equipment &amp; Controls</li> </ul>
<b>5. Transportation</b>	<ul style="list-style-type: none"> <li>• Energy Efficient Vehicles</li> <li>• Logistics (RFID, GPS)</li> </ul>	<ul style="list-style-type: none"> <li>• Mass Transportation</li> <li>• Automated Toll Collection</li> </ul>	<ul style="list-style-type: none"> <li>• Road Pricing Systems</li> </ul>
<b>6. Water &amp; Wastewater</b>	<ul style="list-style-type: none"> <li>• Water Treatment</li> <li>• Water Conservation Products &amp; Services</li> </ul>	<ul style="list-style-type: none"> <li>• Wastewater Treatment</li> <li>• Desalinization</li> </ul>	<ul style="list-style-type: none"> <li>• Water Purification Products &amp; Services</li> </ul>
<b>7. Air &amp; Environment</b>	<ul style="list-style-type: none"> <li>• Cleanup/Safety</li> <li>• Emissions Control</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring/Compliance</li> <li>• Trading &amp; Offsets</li> </ul>	
<b>8. Advanced Materials</b>	<ul style="list-style-type: none"> <li>• Bio-based</li> <li>• Nanotechnology</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical</li> <li>• Recycled Materials &amp; Products</li> </ul>	<ul style="list-style-type: none"> <li>• Environmentally-benign Chemicals (lubricants, solvents, etc)</li> </ul>
<b>9. Manufacturing/Industrial</b>	<ul style="list-style-type: none"> <li>• Advanced Packaging</li> <li>• Monitoring &amp; Control</li> <li>• Smart Production</li> </ul>	<ul style="list-style-type: none"> <li>• Water Equipment</li> <li>• Instruments &amp; Information Systems</li> <li>• Air Pollution Control Equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Waste Management Equipment</li> <li>• Process &amp; Prevention Technology</li> </ul>
<b>10. Agriculture</b>	<ul style="list-style-type: none"> <li>• Natural Pesticides</li> <li>• Land Management</li> </ul>	<ul style="list-style-type: none"> <li>• Aquaculture</li> <li>• Irrigation</li> </ul>	<ul style="list-style-type: none"> <li>• Precision Agriculture</li> </ul>
<b>11. Recycling &amp; Waste</b>	<ul style="list-style-type: none"> <li>• Recycling</li> </ul>	<ul style="list-style-type: none"> <li>• Waste Treatment</li> </ul>	
<b>12. Green Building Materials</b>	<ul style="list-style-type: none"> <li>• Energy &amp; Water Efficient Products/ Systems</li> <li>• Insulation for Glass &amp; Walls</li> <li>• Products Made from Recycled Materials</li> </ul>	<ul style="list-style-type: none"> <li>• Certified Wood Products</li> <li>• Low/Non VOC Sealants &amp; Caulking, Paints, Flooring, Carpets, etc</li> </ul>	<ul style="list-style-type: none"> <li>• Fly Ash Construction Brick</li> <li>• Other</li> </ul>
<b>13. Environmental Services</b>	<ul style="list-style-type: none"> <li>• Environmental Testing &amp; Analysis</li> <li>• Wastewater Treatment Works</li> <li>• Solid Waste Management</li> </ul>	<ul style="list-style-type: none"> <li>• Hazardous Waste Management</li> <li>• Remediation/Industrial Services</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Consulting &amp; Engineering</li> </ul>
<b>14. Services &amp; Support</b>	<ul style="list-style-type: none"> <li>• Wholesalers/Distributors</li> <li>• Sales/Installation</li> </ul>	<ul style="list-style-type: none"> <li>• Repair/Maintenance</li> <li>• Systems Integrators</li> </ul>	

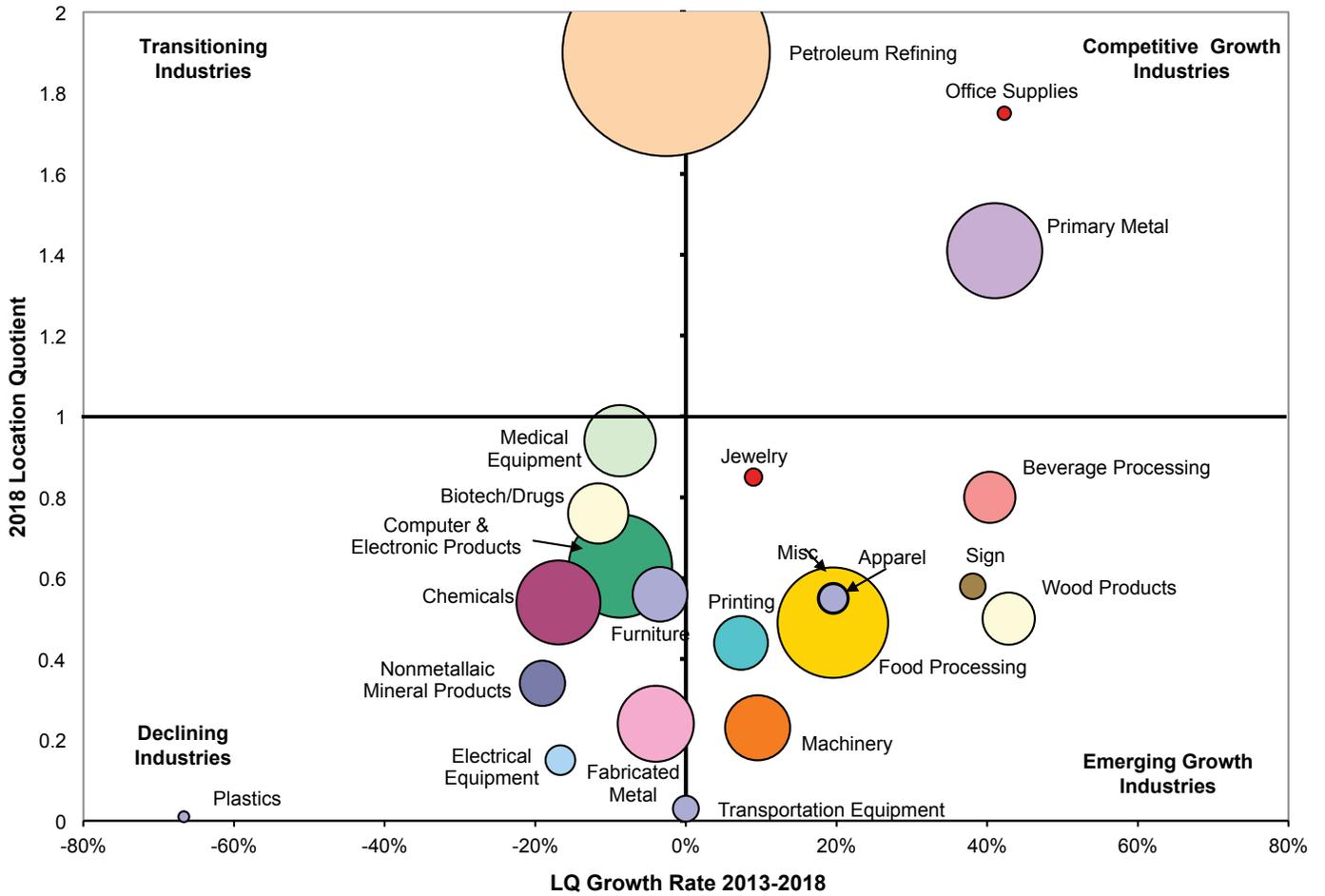
Source: Cleantech Group LLC, *Guide to the Cleantech Index v4.0 - January 2009*, <http://cleantech.com/about/cleantechdefinition.cfm>;  
 New Energy Finance, <http://www.newenergyfinance.com/markets/clean-energy/>; Environmental Business International Inc,  
<http://www.ebiusa.com/Segments.html>; U.S. Green Building Council, [http://www.pa-greenbuildingproducts.org/market\\_opportunity\\_for\\_green.aspx](http://www.pa-greenbuildingproducts.org/market_opportunity_for_green.aspx);  
<http://www.buildinggreen.com/auth/article.cfm/2000/1/1/Building-Materials-What-Makes-a-Product-Green/>

Figure A1: Suisun Bay Channel Dredging Plan



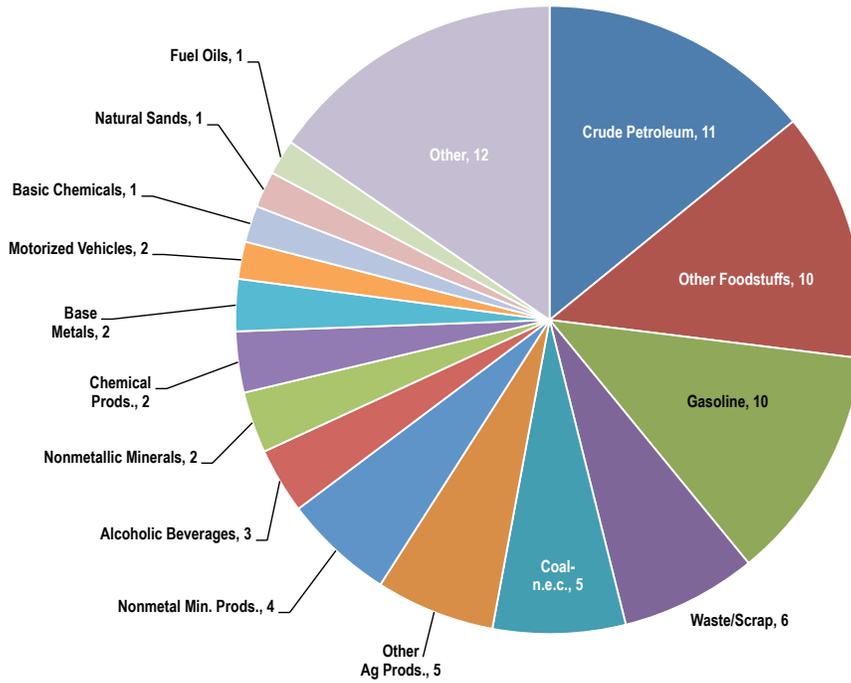
Note: This project will be modified by various channel improvements included in the San Francisco Bay to Stockton Project, authorized by the River and Harbor Act of 1965. San Francisco District South Pacific Division, January 1, 2014

**Figure A2: Local Manufacturing Competitive Strengths**  
 Relative to the National Economy

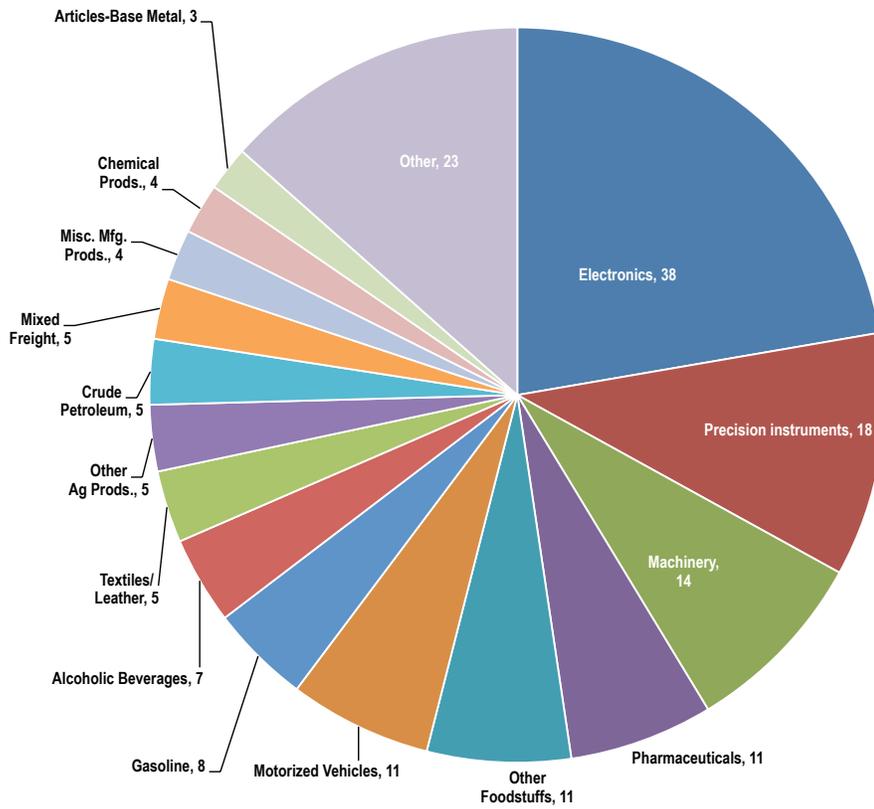


**Figure A3: Outbound Commodities from the Bay Area FAF Zone, 2011**

**THOUSANDS OF TONS**



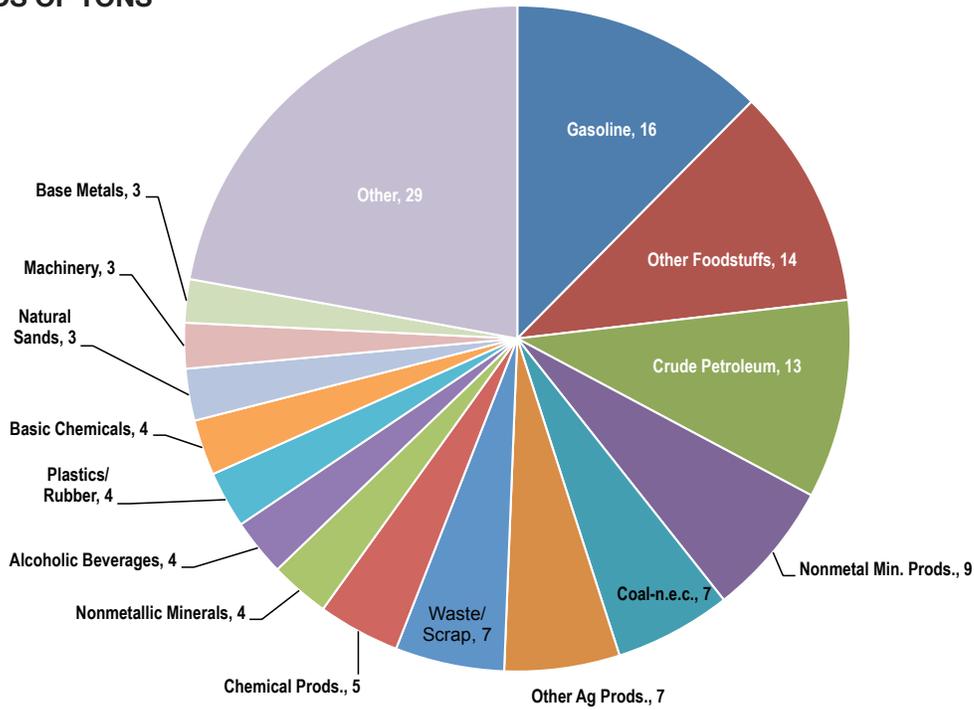
**BILLIONS OF DOLLARS**



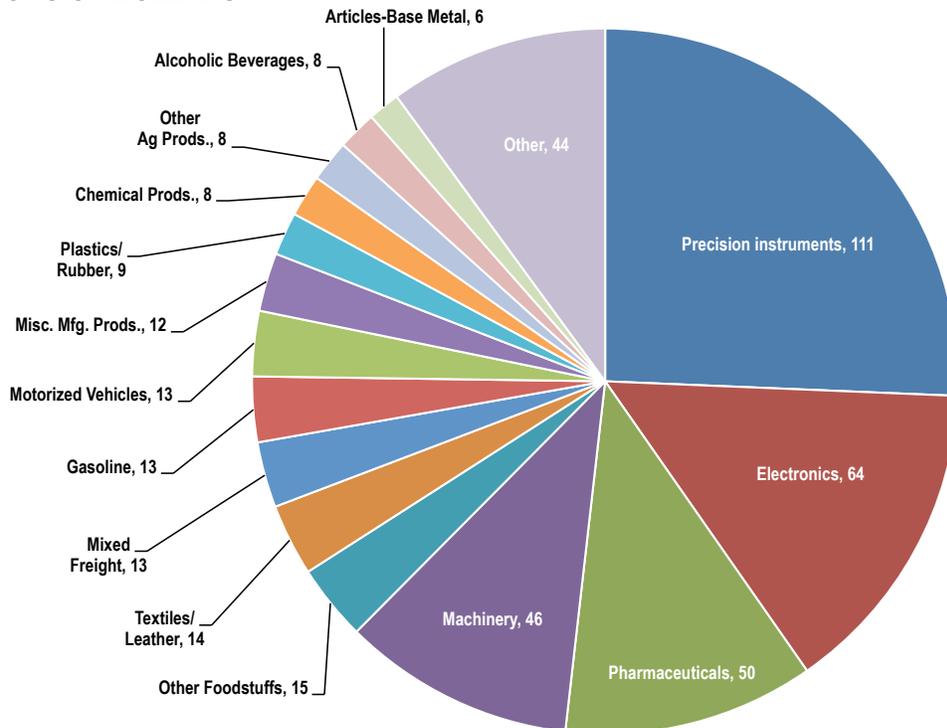
Source: FHWA, FAF 3.4.

**Figure A4: Outbound Commodities from the Bay Area FAF Zone, 2035**

**THOUSANDS OF TONS**



**BILLIONS OF DOLLARS**



Source: FHWA, FAF 3.4.

## Figure A5: Survey Methodology

**STAKEHOLDER SURVEY:** An employer survey was conducted by Jim Casio & Associates of manufacturers and goods movement firms located in the Northern Waterfront Study Area. The purpose of the survey was to gain a better understanding of industry's needs, along with current issues and emerging trends affecting industrial development in the area. Prior to conducting the survey, a database of employers in the manufacturing, warehouse, and transportation sectors was compiled from InfoUSA and EquiFax business lists. The database was reviewed prior to starting the survey to remove obvious duplicates and firms that were no longer in business. The final database for the survey included 154 firms. A survey questionnaire was developed (see *Figure A6* in the Appendix) and made available online using Survey Monkey. All employers were initially contacted by telephone between August 27, 2013 and October 2, 2013 to solicit their participation in the survey. Most firms participated through phone interviews, but all survey options including fax, mail and email were made available in order to maximize response rates. A total of 69 firms completed the survey. This amounted to a 45% survey response rate once all duplicate and inappropriate firms were removed from the database (inappropriate refers to firms that were found to be out of business, or had moved out of the area, or were incorrectly identified as being in the manufacturing sector). The survey responses were collected, tabulated, and analyzed using Survey Monkey. Responses to the survey are shown in Appendix *Figure A7*.

<b>CONTACT INFORMATION</b> <b>FIRM NAME:</b> _____ <b>CONTACT NAME:</b> _____
---

**Figure A6: Northern Waterfront Survey Questionnaire**

<p>This confidential industry survey of industrial and maritime uses along Contra Costa County's Northern Waterfront is being conducted by Jim Cassio &amp; Associates on behalf of participating cities and county. Survey participants will not be publicly identified.</p> <p><b>Please complete &amp; return this questionnaire by:</b> Wednesday, September 11, 2013</p> <p><b>Options for completing/returning this questionnaire:</b>          By Fax: 916-405-3625 (please retain original)          By Email: <a href="mailto:jimcassio@gmail.com">jimcassio@gmail.com</a>          By Mail: 198 Willow Creek Dr, Folsom, CA 95630          Or Call: 916-320-4944</p>	<p>Location of Business: _____          _____</p> <p>Type of Business: _____</p> <p>NAICS Code: _____</p>
--	---

1. How many employees work at your business location?  
 Fewer than 10     11-20     21-50     51-100     More than 100
  
2. What are your plans to grow your business in the next 3-5 years?  
 Expand into new markets  
 Expand into new or remodeled space  
 Add equipment  
 Add new employees  
 Other \_\_\_\_\_
  
3. What are your most significant barriers to achieving your goals?  
 Financial                       Lack of Affordable Space                       Workforce  
 Regulatory                       Economy     Other \_\_\_\_\_
  
4. Are you considering modernization, renovation, or expansion of your facilities within the next two years? Yes \_\_\_\_\_ No \_\_\_\_\_  
  
 If Yes, what are you considering?  
 Warehouse space     Adding another department, division or business  
 Manufacturing/production space     Expansion into adjacent space  
 Office space     Equipment  
 Parking area     Other \_\_\_\_\_
  
5. Do you face any constraints to expansion?                      Yes \_\_\_\_\_ No \_\_\_\_\_
  
6. If Yes, What type of constraints (describe primary obstacles to business growth/expansion)?  
 Financial     Regulatory (Please specify: zoning, building, environmental regulations, etc).  
 Insufficient space in existing building    \_\_\_\_\_  
 Not enough land for expansion     Rail Access \_\_\_\_\_  
 Workforce (Please Specify) \_\_\_\_\_     Port Access \_\_\_\_\_

(CONTINUED NEXT PAGE)

**Figure A6 (CONTINUED): Northern Waterfront Survey Questionnaire**

Other \_\_\_\_\_

7. Could you use assistance with any of the following?

- Financial
- Tax incentives
- Workforce training (Please specify: recruitment, skills training, business management, other) \_\_\_\_\_
- Other \_\_\_\_\_

8. What is your level of satisfaction with each of the following services and infrastructure? (on a rating of 1 (poor) – 5 (excellent))

- Highway/roadway Access \_\_\_\_\_
- Access to markets \_\_\_\_\_
- Access to suppliers \_\_\_\_\_
- Availability of rail transport \_\_\_\_\_
- Availability of water transport \_\_\_\_\_
- Availability of warehouse space/distribution \_\_\_\_\_
- Water supply \_\_\_\_\_
- Sewage/Wastewater treatment \_\_\_\_\_
- Availability of appropriately zoned land \_\_\_\_\_
- Development approval and permitting process \_\_\_\_\_
- Electrical Power \_\_\_\_\_
- Energy costs \_\_\_\_\_
- Waste disposal/recycling \_\_\_\_\_

9. Can you use advanced treated recycled water? \_\_\_\_\_ Yes \_\_\_\_\_ No

10. Suggestions on how to improve any of the services and infrastructure listed above?

---



---

11. Where are your major markets located?

- |                                |                       |
|--------------------------------|-----------------------|
| ▪ San Francisco Bay Area _____ | ▪ Canada/Mexico _____ |
| ▪ Northern California _____    | ▪ Europe _____        |
| ▪ Southern California _____    | ▪ Asia _____          |
| ▪ West Coast _____             | ▪ South America _____ |
| ▪ Mid-West/East Coast _____    | ▪ Other _____         |

12. What percentage of your products do you sell:

- |                            |  |
|----------------------------|--|
| ▪ Locally (Bay Area) _____ | ▪ Within U.S. but outside California _____ |
| ▪ Within California _____  | ▪ Export (outside the U.S.) _____          |

13. Which countries do you export to, if any?

- |               |                |
|---------------|----------------|
| ▪ China _____ | ▪ Mexico _____ |
| ▪ Korea _____ |                |
| ▪ Japan _____ |                |

(CONTINUED NEXT PAGE)

**Figure A6 (CONTINUED): Northern Waterfront Survey Questionnaire**

- Germany \_\_\_\_\_
- Canada \_\_\_\_\_
- Other (name of country) \_\_\_\_\_
- We do not expect to export \_\_\_\_\_

14. Do you ship by:

Water	_____	Pipeline	_____
Rail	_____	Air	_____
Truck	_____		

15. Are shipments containerized, bulk, or both?

Water:	Containerized _____	Bulk _____	Both _____
Rail:	Containerized _____	Bulk _____	Both _____
Truck:	Containerized _____	Bulk _____	Both _____

16. Are there any growth/market opportunities which you cannot meet due to transportation hurdles?  
(please describe)

\_\_\_\_\_

\_\_\_\_\_

17. Are there any growth/market opportunities which you cannot meet due to utility availability/cost?  
(please explain)

\_\_\_\_\_

\_\_\_\_\_

18. What are the types of key inputs to your manufacturing process and where do you source them from?

Type of Inputs: \_\_\_\_\_

\_\_\_\_\_

Source of Inputs: Bay Area \_\_\_\_\_ State \_\_\_\_\_ U.S. \_\_\_\_\_ Foreign \_\_\_\_\_

19. Where are the major vendors in your supply chain located?

San Francisco Bay Area \_\_\_\_\_

Northern California \_\_\_\_\_

Southern California \_\_\_\_\_

United States \_\_\_\_\_

Outside U.S. \_\_\_\_\_

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**Figure A6 (CONTINUED): Northern Waterfront Survey Questionnaire**

21. What are the two biggest issues facing your business?

- Adjusting to economic changes and conditions
- Crime
- Deterioration of surrounding neighborhood
- Lack of trained workers/quality workforce
- High utility costs
- Lack of space for expansion
- Other \_\_\_\_\_

22. Overall what is your opinion of Contra Costa County as a place to do business?

- Excellent       Good       Average       Poor       Very Poor

**Thank you for participating in our economic development market survey of the Northern Waterfront!**

**Figure A7: Survey Responses (Survey Monkey)**

Response Summary

Total Started Survey: 69  
 Total Finished Survey: 69 (100%)

1. How many employees work at your business location?

		Response Percent	Response Count
Fewer than 10		50.7%	35
11-20		17.4%	12
21-50		13.0%	9
51-100		10.1%	7
More than 100		8.7%	6
		<b>answered question</b>	<b>69</b>
		<b>skipped question</b>	<b>0</b>

2. What are your plans to grow your business in the next 3-5 years?

		Response Percent	Response Count
Expand into new markets		57.1%	24
Expand into new or remodeled space		40.5%	17
Add equipment		64.3%	27
Add new employees		57.1%	24
		Other (please specify)	38
		<b>answered question</b>	<b>42</b>
		<b>skipped question</b>	<b>27</b>

(CONTINUED NEXT PAGE)

**Figure A7 (CONTINUED): Survey Responses (Survey Monkey)**

3. What are your most significant barriers to achieving your goals?			
		Response Percent	Response Count
Financial		39.6%	21
Regulatory		26.4%	14
Lack of affordable space		7.5%	4
Economy		47.2%	25
Workforce		15.1%	8
		Other (please specify) s	30
<b>answered question</b>			<b>53</b>
<b>skipped question</b>			<b>16</b>

4. Are you considering modernization, renovation, or expansion of your facilities within the next two years?			
		Response Percent	Response Count
Yes		33.3%	23
No		66.7%	46
<b>answered question</b>			<b>69</b>
<b>skipped question</b>			<b>0</b>

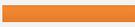
5. If Yes, what are you considering?			
		Response Percent	Response Count
Warehouse space		38.9%	7
Manufacturing/production space		38.9%	7
Office space		22.2%	4
Parking area		27.8%	5
Adding another department, division or business		11.1%	2
Expansion into adjacent space		11.1%	2
Equipment		77.8%	14
		Other (please specify) s	12
<b>answered question</b>			<b>18</b>

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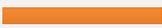
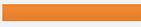
**Figure A7 (CONTINUED): Survey Responses (Survey Monkey)**

		skipped question	51
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6. Do you face any constraints to expansion?

		Response Percent	Response Count
Yes		55.2%	32
No		44.8%	26
		answered question	58
		skipped question	11

7. If Yes, What type of constraints?

		Response Percent	Response Count
Financial		53.3%	16
Insufficient space in existing building		30.0%	9
Not enough land for expansion		16.7%	5
Workforce		10.0%	3
Regulatory		46.7%	14
Rail Access		6.7%	2
Port Access		3.3%	1
		Other (please specify s	10
		answered question	30
		skipped question	39

8. If you checked "Workforce" in question 10, please explain:

	Response Count
s	4
answered question	
4	
skipped question	
65	

9. If you checked "Regulatory" in question 10, please explain:

Response
----------

(CONTINUED NEXT PAGE)

**Figure A7 (CONTINUED): Survey Responses (Survey Monkey)**

		Count					
s		15					
answered question		15					
skipped question		54					
<b>10. Could you use assistance with any of the following?</b>							
		Response Percent	Response Count				
<b>Financial</b>		53.3%	16				
<b>Tax incentives</b>		66.7%	20				
<b>Workforce training</b>		23.3%	7				
Other (please specify)			41				
s			41				
answered question			30				
skipped question			39				
<b>11. If you checked "Workforce training," please explain:</b>			D				
		Response Count					
s		6					
answered question		6					
skipped question		63					
<b>12. What is your level of satisfaction with each of the following services and infrastructure?</b>			C				
	Poor	Average	Excellent	Rating Average	Rating Count		
<b>Highway/roadway access</b>	17.6% (12)	5.9% (4)	<b>39.7% (27)</b>	11.8% (8)	25.0% (17)	3.21	68
<b>Access to markets</b>	10.4% (7)	3.0% (2)	<b>53.7% (36)</b>	14.9% (10)	17.9% (12)	3.27	67
<b>Access to suppliers</b>	9.0% (6)	1.5% (1)	<b>53.7% (36)</b>	14.9% (10)	20.9% (14)	3.37	67
<b>Availability of rail transport</b>	19.0% (11)	1.7% (1)	<b>36.2% (21)</b>	20.7% (12)	22.4% (13)	3.26	58
<b>Availability of water transport</b>	21.4% (12)	1.8% (1)	<b>48.2% (27)</b>	10.7% (6)	17.9% (10)	3.02	56
<b>Availability of warehouse space/distribution</b>	11.7% (7)	10.0% (6)	<b>33.3% (20)</b>	16.7% (10)	28.3% (17)	3.40	60

(CONTINUED NEXT PAGE)

**Figure A7 (CONTINUED): Survey Responses (Survey Monkey)**

<b>Water supply</b>	11.8% (8)	4.4% (3)	<b>39.7%</b> <b>(27)</b>	23.5% (16)	20.6% (14)	3.37	68
<b>Sewage/wastewater treatment</b>	10.9% (7)	1.6% (1)	<b>39.1%</b> <b>(25)</b>	21.9% (14)	26.6% (17)	3.52	64
<b>Availability of appropriately zoned land</b>	15.6% (10)	3.1% (2)	<b>51.6%</b> <b>(33)</b>	12.5% (8)	17.2% (11)	3.13	64
<b>Development approval and permitting process</b>	21.1% (12)	12.3% (7)	<b>47.4%</b> <b>(27)</b>	7.0% (4)	12.3% (7)	2.77	57
<b>Electrical Power</b>	10.3% (7)	2.9% (2)	<b>38.2%</b> <b>(26)</b>	20.6% (14)	27.9% (19)	3.53	68
<b>Energy costs</b>	27.7% (18)	7.7% (5)	<b>47.7%</b> <b>(31)</b>	9.2% (6)	7.7% (5)	2.62	65
<b>Waste disposal/recycling</b>	16.4% (11)	4.5% (3)	<b>40.3%</b> <b>(27)</b>	10.4% (7)	28.4% (19)	3.30	67
<b>answered question</b>							<b>68</b>
<b>skipped question</b>							<b>1</b>

13. Suggestions on how to improve any of the services and infrastructure listed above:

	Response Count
<b>s</b>	58
<b>answered question</b>	
	<b>58</b>
<b>skipped question</b>	
	<b>11</b>

14. Can you use advanced treated recycled water?

	Response Percent	Response Count
<b>Yes</b>	 28.4%	19
<b>No</b>	 71.6%	48
<b>answered question</b>		<b>67</b>
<b>skipped question</b>		<b>2</b>

15. Where are the major vendors/suppliers in your supply chain located?

	Response Percent	Response Count
<b>San Francisco Bay Area</b>	 55.2%	37
<b>Northern California, but outside the Bay Area</b>	 38.8%	26
<b>Southern California</b>	 20.9%	14

(CONTINUED NEXT PAGE)

**Figure A7 (CONTINUED): Survey Responses (Survey Monkey)**

United States, but outside California		41.8%	28
Outside the U.S.		9.0%	6
<b>answered question</b>			<b>67</b>
<b>skipped question</b>			<b>2</b>

**16. Where are your major markets located?**

		Response Percent	Response Count
San Francisco Bay Area		63.2%	43
Northern California		57.4%	39
Southern California		20.6%	14
West Coast		26.5%	18
Mid-West/East Coast		22.1%	15
Canada/Mexico		10.3%	7
Europe		7.4%	5
Asia		5.9%	4
South America		5.9%	4
Other (please specify) s			7
<b>answered question</b>			<b>68</b>
<b>skipped question</b>			<b>1</b>

**17. Do you export?**

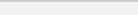
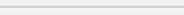
		Response Percent	Response Count
Yes		26.2%	17
No		73.8%	48
<b>answered question</b>			<b>65</b>
<b>skipped question</b>			<b>4</b>

**18. If yes, to which countries?**

		Response Percent	Response Count
China		53.8%	7
Korea		30.8%	4

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**Figure A7 (CONTINUED): Survey Responses (Survey Monkey)**

Korea		30.8%	4
Japan		61.5%	8
Mexico		46.2%	6
Germany		46.2%	6
Canada		61.5%	8
		Other (please specify) s	18
		<b>answered question</b>	<b>13</b>
		<b>skipped question</b>	<b>56</b>

19. What percentage of your products do you sell:		D	
		Response Percent	Response Count
Locally (Bay Area) <a href="#">Show Responses</a>		86.2%	56
Within California <a href="#">Show Responses</a>		67.7%	44
Within U.S. but outside California <a href="#">Show Responses</a>		40.0%	26
Export (outside the U.S.) <a href="#">Show Responses</a>		26.2%	17
		<b>answered question</b>	<b>65</b>
		<b>skipped question</b>	<b>4</b>

20. If you don't currently export, do you plan to export in the future?			
		Response Percent	Response Count
Yes		2.1%	1
No		97.9%	46
		Please explain s	15
		<b>answered question</b>	<b>47</b>
		<b>skipped question</b>	<b>22</b>

21. Do you ship by:		C	
		Response Percent	Response Count
Water		15.0%	9

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**Figure A7 (CONTINUED): Survey Responses (Survey Monkey)**

Rail		10.0%	6
Truck		93.3%	56
Pipeline		8.3%	5
Air		31.7%	19
<b>answered question</b>			<b>60</b>
<b>skipped question</b>			<b>9</b>

22. Are shipments containerized, bulk, or both?

	Containerized	Bulk	Both	Rating Count
<b>Water</b>	<b>55.6% (5)</b>	44.4% (4)	0.0% (0)	9
<b>Rail</b>	33.3% (2)	<b>66.7% (4)</b>	0.0% (0)	6
<b>Truck</b>	23.5% (12)	<b>66.7% (34)</b>	13.7% (7)	51
<b>answered question</b>				<b>51</b>
<b>skipped question</b>				<b>18</b>

23. Are there any growth/market opportunities which you cannot meet due to transportation hurdles? If so, please explain:

	Response Count	
<b>s</b>	62	
<b>answered question</b>		<b>62</b>
<b>skipped question</b>		<b>7</b>

24. Are there any growth/market opportunities which you cannot meet due to utility availability/cost? If so, please explain:

	Response Count	
<b>s</b>	62	
<b>answered question</b>		<b>62</b>
<b>skipped question</b>		<b>7</b>

25. What are the types of key inputs to your manufacturing process?

d

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**Figure A7 (CONTINUED): Survey Responses (Survey Monkey)**

	Response Count
s	64
<b>answered question</b>	<b>64</b>
<b>skipped question</b>	<b>5</b>

26. Where do you source your key inputs?

	Response Percent	Response Count
Bay Area	60.8%	31
California, but outside the Bay Area	51.0%	26
U.S. but outside California	45.1%	23
Foreign	19.6%	10
Please explain: s		20
<b>answered question</b>		<b>51</b>
<b>skipped question</b>		<b>18</b>

27. What are the two biggest issues facing your business? (please only select two)

	Response Percent	Response Count
Adjusting to economic changes and conditions	66.1%	41
Crime	14.5%	9
Deterioration of surrounding neighborhood	19.4%	12
Lack of trained workers/quality workforce	29.0%	18
High utility costs	27.4%	17
Lack of space for expansion	11.3%	7
Other (please specify) s		28
<b>answered question</b>		<b>62</b>
<b>skipped question</b>		<b>7</b>

28. Overall what is your opinion of Contra Costa County as a place to do business?

	Rating Average	Rating Count
Poor		
Average		
Excellent		
C		

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**Figure A7 (CONTINUED): Survey Responses (Survey Monkey)**

	5.9%	5.9%	33.8%	<b>36.8%</b>	17.6%	3.54	68
	(4)	(4)	(23)	<b>(25)</b>	(12)		
	answered question						<b>68</b>
	skipped question						<b>1</b>

29. Comments:	
	Response Count
	<b>s</b> 36
	answered question <b>36</b>
	skipped question <b>33</b>

**Figure A8: Industrial Site Selection Criteria**

Site selection factors	Very Important %	Important %	Minor Consideration %	Of No Importance %
<b>Labor</b>				
Availability of skilled labor	53.9	35.5	7.1	3.5
Availability of unskilled labor	10.0	32.9	33.6	23.6
Training programs	18.0	36.7	33.1	12.2
Labor costs	42.6	48.2	5.7	3.5
Low union profile	47.1	26.4	11.4	15.0
Right-to-work state	45.8	26.8	13.4	14.1
<b>Transportation/Telecommunications</b>				
Highway accessibility	57.0	33.1	6.3	3.5
Railroad service	27.1	16.5	21.2	35.3
Accessibility to major airport	17.4	35.5	30.4	16.7
Waterway or oceanport accessibility	5.9	14.0	25.0	55.1
Availability of advanced ICT services	49.3	35.8	11.4	3.6
<b>Finance</b>				
Availability of long-term financing	31.9	31.2	20.6	16.3
Corporate tax rate	35.7	43.6	11.4	9.3
Tax exemptions	32.6	42.8	15.2	9.4
State and local incentives	33.1	38.0	21.1	7.7
<b>Other</b>				
Available buildings	41.7	36.7	14.4	7.2
Available land	18.7	40.3	22.3	18.7
Occupancy or construction costs	35.3	47.5	11.5	5.8
Expedited or "fast-track" permitting	29.2	38.0	22.6	10.2
Raw materials availability	19.3	30.4	25.9	24.4
Energy availability and costs	35.3	46.0	12.2	6.5
Environmental regulations	31.2	39.9	18.8	10.1
Proximity to major markets	32.1	40.1	18.2	9.5
Proximity to suppliers	15.8	39.1	30.8	14.3
Inbound/outbound shipping costs	26.7	37.0	18.5	17.8
Proximity to technical college/training	15.3	35.0	27.7	21.9
<b>Quality-of-life factors</b>				
Climate	18.6	36.4	37.9	7.1
Housing availability	15.8	54.0	23.0	7.2
Housing costs	19.4	47.5	25.9	7.2
Healthcare facilities	19.4	50.4	25.2	5.0
Ratings of public schools	21.6	41.7	29.5	7.2
Cultural opportunities	10.8	38.1	41.0	10.1
Recreational opportunities	11.0	41.9	38.2	8.8
Colleges and universities in area	17.4	44.2	33.3	5.1
Low crime rate	31.4	47.9	18.6	2.1

\*All figures are percentages and are rounded to a tenth of a percent

Source: *Area Development Magazine*





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