Exhibit A

Prepared Direct Testimony of
Stephen Shafer
on Behalf of San Diego Unified Port District

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Company: San Diego Unified Port District
Application: 17-09-005
Witness: Stephen Shafer
Exhibit No.: SDUPD-____

PREPARED DIRECT TESTIMONY OF

STEPHEN SHAFER

ON BEHALF OF SAN DIEGO UNIFIED PORT DISTRICT

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

SEPTEMBER 26, 2017

TABLE OF CONTENTS

I. WITNESS BACKGROUND, EDUCATION, EXPERIENCE, BUSINESS TITLE AND ADDRESS

My name is Stephen Shafer and my business address is 3165 Pacific Highway, San Diego, CA 92101. I am the Maritime Program Manager at the San Diego Unified Port District ("District"). My primary responsibilities include leading economic, regulatory and policy analysis for maritime, rail, and road transportation topics within the District, including both passenger and freight mobility issues; assessing the impacts of policy or operational decisions (including utility costs) on current and future District business; analyzing operational and capital investments to quantify likely business impacts and returns on investment; developing strategic plans on freight and passenger transportation topics; representing the District in interactions with local and state transportation authorities on transportation programs and plans; and providing economic and benefit-cost analysis for use in District grant proposals and plans.

I began work at the District in May 2017. Prior to joining the District, I was an economist and transportation industry analyst at the U.S. Department of Transportation's Maritime Administration from May 2010 to May 2017, and I was an industry economist at the Federal Maritime Commission (FMC) from July 2008 to May 2010. In those previous positions, I served as an expert on port infrastructure and investments, as well as passenger and freight transportation markets, with an emphasis on quantitative and policy analysis. My work included developing the benefit-cost analysis (BCA) for repowering U.S.-flag vessels on the Great Lakes and reviewing grant BCAs; managing cooperative agreements to perform economic impact studies on the U.S. tugboat, towboat, and barge industry and unplanned lock closures; incorporating maritime transportation into the National Freight Multimodal Network and related grant programs; assessing the viability and cost modelling for short sea shipping services (called Marine Highways); and performing econometric analysis of rate impacts from ocean carrier operational agreements.

In 2004, I graduated from Georgetown University's School of Foreign Service with a Bachelor's of Science in Foreign Service. I received two Master's Degrees from Syracuse University's Maxwell School in 2008. Those degrees were a Master's of Arts in Economics and a

Master's of Public Administration. In 2015, I completed the Rutger's University / I-95 Corridor Coalition Freight Academy.

I have not previously submitted testimony before the California Public Utilities Commission.

The balance of this testimony is organized as follows:

- **Part II** provides an overview of testimony;
- **Part III** provides a summary of the District's recommendations;
- **Parts IV through IV** provide details on my individual opinions;

Attached to my testimony as **Exhibit 1** is a document entitled "Final Report: Economic Impacts of the Port of San Diego in 2015" by Economic & Planning Systems, Inc. (publication date December 20, 2016). Such report includes two Appendices. Appendix A is entitled "The Local and Regional Economic Impacts of the Port of San Diego Marine Terminals", prepared by Martin Associates, dated August 1, 2016. Appendix B is entitled "Economic Impact Analysis of the San Diego Cruise Sector 2015", prepared by Business Research & Economic Advisors, dated June 2016 ("BREA Report").

II. OVERVIEW OF TESTIMONY

The District plays a vital role in the regional economy through its management of the Tidelands Trust and operation of cruise and freight maritime terminals. The District is also a national leader in policies that improve air quality throughout the region and State by establishing environment enhancement policies in documents such as its 2013 Climate Action Plan (CAP). These policies, as well as the California Air Resource Board (CARB) At-Berth Regulation,[1] require that container, cruise and refrigerated vessels use electrical power that is provided by on-shore (shore power) rather than on-ship facilities. The District is pursuing efforts to ensure that these environmental requirements are met while retaining the economic benefits that the maritime cruise and freight industries provide to the region.

[1] California Air Resources Board, "Airborne Toxic Control Measure for Auxiliary Diesel Engines Operated on Ocean-Going Vessels At-Berth in a California Port", available online at: https://www.arb.ca.gov/ports/shorepower/finalregulation.pdf

This testimony explains the potentially devastating impacts on the District's cruise business caused by the pairing of the CARB At-Berth Regulation and the increased cost to the District's existing cruise ship shore power account resulting from the transition from San Diego Gas & Electric Company's (SDG&E) Schedule Time Of Use (TOU)-A Small Commercial Rate to the Medium/Large Commercial and Industrial (M/L C&I) rate, specifically Schedule A6-TOU. The full background on the GRC Phase 2 and the implications for the District's cruise ship terminal account are described in greater detail in Todd Cahill's testimony in Chapter 1 of SDG&E's application.

As described in SDG&E witness Cahill's direct testimony in Chapter 1 and in SDG&E Witness Fang in Chapter 4 of the testimony supporting SDG&E's application, the District's distinct load shape does not readily lend itself to an existing rate, while significant increases in the cruise ship terminal account shore power rate would likely have drastic – and compounding – negative effects on cruise traffic at the terminals. These impacts are further explained by Dr. Borison in his testimony. In addition, the CARB At-Berth Regulation and current technological limitations mean there are no current realistic alternatives to shore power for cruise vessels calling at the District's terminals except to move to other locations. In other words, in the absence of rate relief, the high shore power rate will have the unintended consequence of pushing much or all of the cruise industry out of San Diego, resulting in significant negative economic impacts to the San Diego regional economy.

In order to overcome this challenge, the District worked with SDG&E on an Energy Management Plan (EMP) under AB 628, which not only provides environmental benefits to the region but also provides support for exploring load-leveling technologies and a five-year shore power rate adjustment. These efforts will support the regionally-significant cruise industry and provide the parties time to develop a solution to better address the District's cruise shore power rate difficulties.

Specifically, on September 13, 2017, SDG&E filed A.17-09-0005 with the California Public Utilities Commission (Commission) in which SDG&E requests Commission approval for the shore power rate proposal, Energy Efficiency (EE) proposal, and Enhanced Partnership

Proposal (EPP) as described in the EMP. The EMP's six goals provide substantial environmental and economic benefits for the San Diego region and the State of California, pursuant to the requirements set forth in Assembly Bill (AB) 628.[2] These goals are:

- Maintain maritime cruise industry activity at the District's cruise terminals through a shore power rate that will ensure stability of grid-based power rates for the cruise industry located in San Diego and support CARB driven efforts to reduce cruise ship emissions;
- Promote stabilization of energy costs through energy efficiency and specialized measures to incentivize energy efficiency by District tenants;
- Advance clean transportation through development of medium and heavy-duty vehicle charging infrastructure;
- Deploy advanced technologies such as energy storage to reduce peak energy demands and micro-grids to support District redevelopment needs;
- Pursue "clean generation" sources of electricity through existing SDG&E programs and installation of solar power infrastructure on District properties; and
- Expand beyond the narrow scope of the existing Energy Efficiency (EE) Local Government Partnership (LGP) Agreement between SDG&E and the District to provide the needed resources to support the District's EMP components.

The purpose of this testimony is to support SDG&E's Application and to provide additional information to the Commission on the importance of the EMP proposals. The District is submitting this testimony well ahead of the protest date on the Application to present comprehensive evidentiary support for the Commission approval in addition to the testimony presented by SDG&E with its application. The District's positions here are further supported by the testimony of Dr. Adam Borison of BRG submitted concurrently with this testimony.

III. SUMMARY OF RECOMMENDATIONS

The District makes the following recommendations:

[2] SDG&E Witness Cahill's testimony provides further background on AB 628 at pp. TC-2 – TC-3.

- The Commission should approve the proposed cruise ship terminal account discount (EMP Discount) that will be indexed to SDG&E's class-average electric rate for the M/L C&I customer class for electricity used for shore power through the District's cruise ship terminal account. The proposed EMP Discount accommodates the special features of cruise ship business and shore power demand, allows the District to focus on its areas of expertise (maritime commerce) while allowing SDG&E to serve as the primary utility to the three or more cruise lines using shore power at the District's cruise terminals, and facilitates technological exploration that will help improve the shore power load factor and provide opportunities to reduce peak loads.
- The Commission should approve the funding for the EE and EPP proposals contained in the SDG&E / District EMP in part to perform research and other activities to assist the District's cruise business in the transition from "Schedule TOU-A" to Schedule A6-TOU, as well as to expand District-wide energy efficiency and conservation efforts.

Taken together, these recommendations will prevent substantial economic damage to the San Diego region caused by a loss of the cruise business in San Diego. The importance of this industry is further reinforced by the 21 letters of support from regional political leadership, union leadership, and the cruise lines attached to SDG&E's application as Appendix H.

IV. BACKGROUND

A. San Diego Unified Port District Operations

The District is a self-supporting public-benefit corporation established by the California State Legislature in 1962 to manage San Diego Bay and the surrounding waterfront land, with the mission to protect the Tidelands Trust resources by providing economic vitality and community benefit through a balanced approach to maritime industry, tourism, water and land recreation, environmental stewardship and public safety. The District controls more than 33 of the 54 total miles along the San Diego Bay, as well as about 2,500 acres of land and almost 3,000 acres of water, spread across its five-member city jurisdictions of Chula Vista, Coronado, Imperial Beach,

National City, and San Diego. Figure 1 below illustrates the District's jurisdiction and planning areas.

While the focus of this testimony is on the District's maritime operations, it is important to recognize that the District also maintains over twenty public parks, governs the Harbor Police Department, and leases land to hundreds of tenant businesses around San Diego Bay. Altogether, these efforts directly supported over 43,600 jobs and more than $5.4 billion in economic output in 2015.[3]

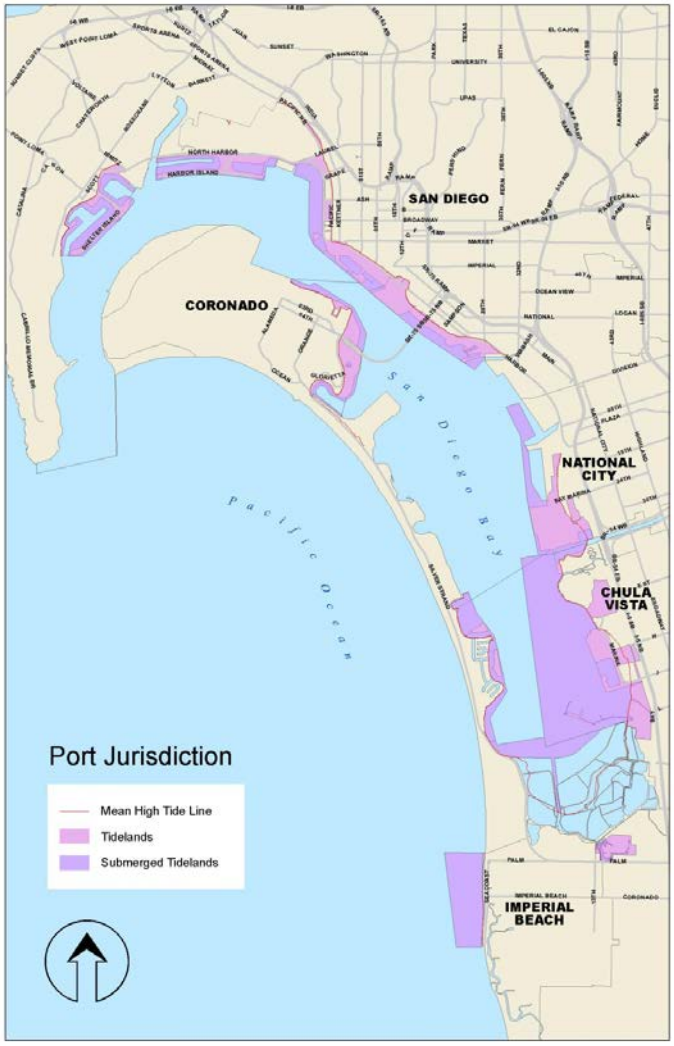

Figure 1: Map of San Diego Unified Port District Planning Jurisdiction

The District maritime operations take place at four marine terminals: the Tenth Avenue Marine Terminal (TAMT), the National City Marine Terminal (NCMT), the B Street Pier Cruise

[3] *See* Exhibit 1, Economic & Planning Systems, Inc., "Economic Impacts of the San Diego Unified Port District in 2015" at p.7.

Terminal (B Street), and the Broadway Pier Cruise Terminal (Broadway). All four of these terminals are managed to attract businesses and tourists to the San Diego region while minimizing impacts on the Tidelands and surrounding communities. They provide access to foreign and domestic markets, jobs, and materials, while attracting residents and tourists to the Tidelands. The terminals also support regional businesses such as shipyards, construction firms, hotels, restaurants and other retailers that operate on and around the San Diego waterfront. They handle a diverse range of maritime operations, including passenger operations out of the two cruise terminals (B Street and Broadway), general cargoes out of the port-operated TAMT, and roll-on/roll-off cargoes out of the privately-operated NCMT.

The District's cruise operations take place at the B Street and Broadway Cruise Terminals, which serve cruise vessels at three berths located alongside two piers. B Street is the larger facility, with a North and South berth, and the Broadway Pier terminal has one berth. These three berths are significant assets for the District, and for Southern California, as they represent three of the six deepwater cruise berths in Southern California that are capable of accepting homeport calls. All three berths have equipment to provide shore power to cruise vessels, although currently the majority of shore power calls are at the B Street Cruise Terminal's north berth.

The regional economic benefits of ports are well-recognized. A cruise "homeport" call occurs when a cruise ship discharges all of its passengers and takes on new passengers over a period of eight to ten hours. Each of these calls generates nearly $2 million in regional economic impact.[4] About 60% of the District's cruise passengers sail aboard homeport vessels. The District's berths also accommodate "visitation" calls, which are calls where passengers disembark for a day of sight-seeing and shopping in the San Diego region and then return to the vessel at the end of the day to sail to their next destination. Each of these visitation calls generates nearly $600,000 in regional economic impact.[5]

[4] *See* Exhibit 1, Appendix B "BREA Report" at p. 30.
[5] *See* Exhibit 1, Appendix B "BREA Report" at p. 28.

The San Diego cruise season currently stretches from late September to May. At this time, the two main homeport call cruise lines are Holland America Lines and Disney Cruise Lines and the largest visitation call line is Princess Cruise Lines. Vessels from all three of these lines utilize the single shore power account when they are at-berth.[6] The volume of cruise vessels calling at the District's cruise terminals is largely a function of the regional cruise business cycle as depicted in Figure 2 below. Based on current booking, the District's primary cruise lines are continuing to increase their calls by shore power capable vessels, and as seen in Figure 3 below, the District forecasts that there is sufficient market demand for cruise passenger volumes to nearly triple from 2016 levels by 2030. The District expects that growth to continue as long as it can provide cost-competitive services such as shore power. With increased demand, the estimated base case economic damage per year of the new SDG&E rate without EMP discount would increase from the $50 million noted by Dr. Borison to $100 million or more.

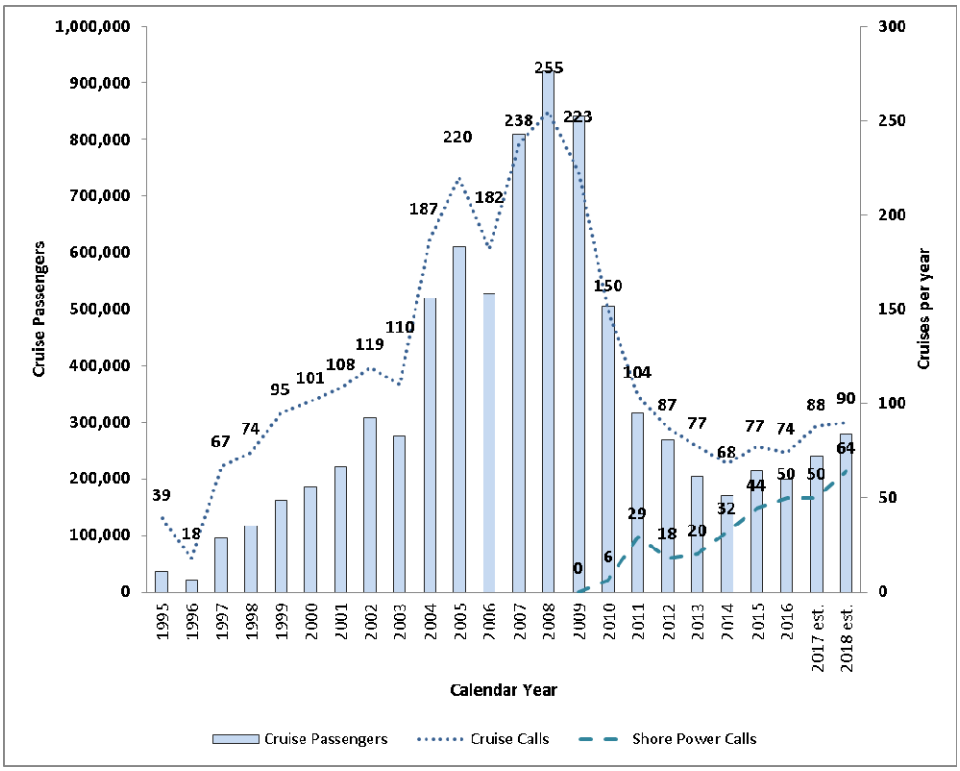

Figure 2: San Diego Unified Port District Passenger Volumes and Vessel Calls by Calendar Year

[6] At this time, the District has shore power equipment for all three berths, with a permanent shore power plug on the B Street north berth and a second plug that can be moved between the B Street south berth and the Broadway Terminal berth. The District's cruise ship terminal provides sufficient electrical capacity to service one ship at a time.

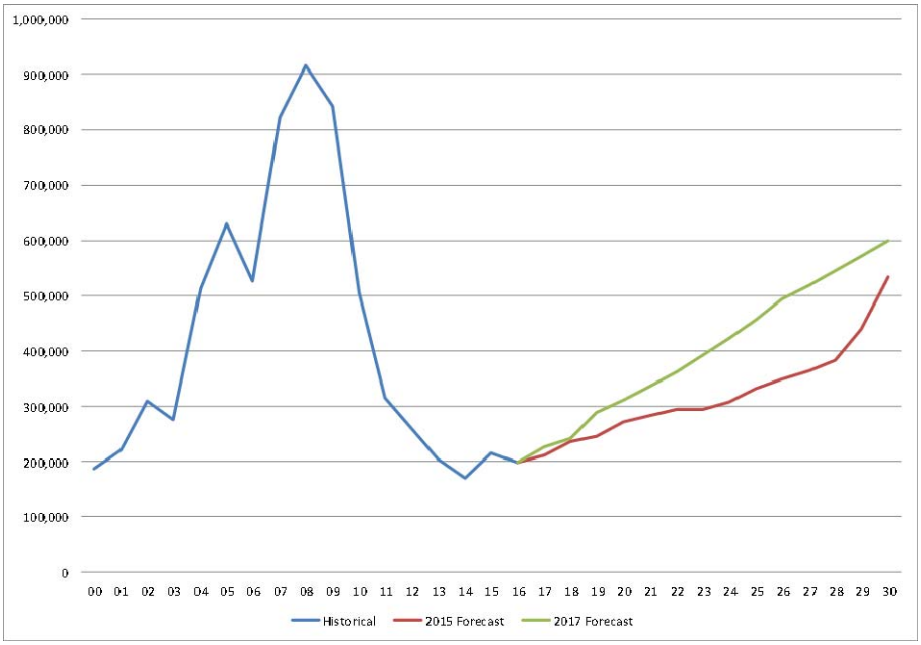

Figure 3: District Forecasted Cruise Passenger Volumes 2016-2030.

B. The District's Environmental Programs

In addition to providing maritime freight and cruise services to the San Diego Region, the District is also a national leader in deploying innovative policies and technologies to maximize public benefits of the maritime and land uses around the bay while minimizing environmental impacts. Efforts such as the District's Green Port Program, its industry-leading CAP, shore power initiatives, and the EMP all fall into this category of environmental leadership in reducing air emissions such as greenhouse gasses (GHG) and other particulate matter, while maintaining the economic benefits generated by maritime-related commerce. The results of the District's shore power efforts, which are in compliance with the CARB at-berth regulation, are visible in the blue "Shore power Calls" line in Figure 2 above, which shows the increasing level of shore power utilization by the District's cruise line partners since 2009. Indeed, because of the At Berth regulations fleet definition (shore power requirements apply to lines calling five or more times per calendar year) and the increasing shore power requirements, nearly all future growth in cruise ship calls in San Diego will be by vessels utilizing shore power. Based on current bookings out to mid-2019, the District projects continued growth in cruise vessel calls and passenger levels as long as competitive shore power rates remain in place.

The District developed its Green Port Program to support the goals of the Green Port Policy that was approved by the Board of Port Commissioners in 2008. The ultimate goal of the program is to achieve long-term environmental, societal and economic benefits through measurable sustainability goals in six key areas: Energy, Waste Management, Sustainable Development, Water, Air, and Sustainable Business Practices. These goals are then evaluated on an annual basis.

Since 2013, the District has been evolving and improving an integrated planning process that is being used to update the Port Master Plan. The District's CAP establishes GHG emissions reduction goals, which are supported by efforts contained in the EMP such as energy efficiency, expanding the use of alternative powered vehicles and vessels, advanced technologies, and shore power.[7] The CAP goals are also related to Senate Bill 32, enacted by the California legislature in 2016 to reduce statewide GHG emissions by 40% below 1990 levels by 2030, ultimately reaching an 80% GHG emissions reduction by 2050. The EE and EPP proposals in the EMP provide the District with a strategic partnership and additional tools as it works to comply with California's 2030 and 2050 GHG emission reduction goals.

C. The Perfect Storm: CARB Regulations, Shore Power, and 2016 GRC Phase 2 Changes

In order to successfully attract cruise ship homeport and visitation calls to the San Diego region, the District must provide economically competitive services that comply with all regulatory requirements. The combined effects of the CARB At-Berth Regulations, the dependence of cruise lines on utility-provided shore power to comply with these regulations, the availability of much cheaper shore power at the other West Coast cruise ship terminals,[8] and the application of a rate structure with fixed and demand charges is creating a "perfect storm" scenario for the District and the San Diego cruise industry. In the absence of the EMP Discount, San Diego will be unable to both meet regulatory requirements and remain cost competitive for cruise ships utilizing shore power.

[7] https://www.portofsandiego.org/document/environment/climate-mitigation-and-adaptation-plan/documents-1/5515-port-of-san-diego-climate-action-plan/file.html, page 20.

[8] *See* Testimony of Dr. Adam Borrison, Exh. SDUPD-____ at p. 8.

1. CARB At-Berth Requirements

CARB established the "Airborne Toxic Control Measure for Auxiliary Diesel Engines Operated on Ocean-Going Vessels At-Berth in a California Port" regulation, commonly referred to as the At-Berth Regulation, in December 2007 to "reduce emissions from diesel auxiliary engines on container ships, passenger ships, and refrigerated-cargo ships while berthing at a California Port." These regulatory requirements went into effect in 2010, with the minimum shore power fleet requirements becoming effective in 2014.[9] The regulation applies to California Ports of Hueneme, Long Beach, Los Angeles, Oakland, San Diego, and San Francisco. The At-Berth Regulation provides vessel fleet operators visiting these ports with two options to reduce at-berth emissions from auxiliary engines: 1) turn off auxiliary engines and connect the vessel to some other source of power, (*i.e.*, shore power); or 2) use alternative control technology that achieve equivalent emission reductions. There are other approaches to controlling emissions from ships, such as using barges with control equipment. However, these approaches are still experimental and are not being adopted by cruise lines at this time. The dominant commercial approach to control emissions from cruise ships is shore power since the other approaches do not meet the operations and experience requirements for passenger-serving cruise ships.

The District completed installation of its shore power infrastructure in December 2010 in anticipation of the need to assist cruise lines to comply with the regulation.[10] However, the main

[9] *See* the CARB web-page "Shore Power for Ocean-going Vessels," August 22, 2017, https://www.arb.ca.gov/ports/shorepower/shorepower.htm. The applicable regulation is found in California Code of Regulations ("CCR"), title 17, chapter 1, subchapter 7.5, § 93118.3. https://www.arb.ca.gov/ports/shorepower/finalregulation.pdf .

[10] For cruise ship fleets (i.e., those calling at a specific California port five or more times per calendar year), the following calendar was set for compliance:

- January 1, 2010: Shore-power equipped vessels that are part of an affected fleet must use shore power while visiting a compatible shore-power berth.
- January 1, 2014: (1) 50% of the fleet's visits to a port must be shore-power visits; (2) Auxiliary engine power generated by the fleet must be reduced by 50%.
- January 1, 2017: (1) 70% of the fleet's visits to a port must be shore-power visits; (2) Auxiliary engine power generated by the fleet must be reduced by 70%.
- January 1, 2020: (1) 80% of the fleet's visits to a port must be shore-power visits; (2) Auxiliary engine power generated by the fleet must be reduced by 80%.

It is worth noting that as of January 1, 2010, any shore power capable vessel must use shore power when at berth if the shore power is available. The requirements going into effect in 2014, 2017, and 2020 specify the percentage of visits that must utilize shore power, however, it is worth

impact of the At-Berth regulation on the District's cruise business was first felt in 2014 when the requirement that 50% of a fleet's visits to a port must be shore power visits went into effect. The At-Berth regulation contains a fleet definition that requires cruise lines to use shore power if they call at a specific California port more than five (5) times per year.[11] As an immediate response to the At-Berth Regulation, cruise lines that lacked shore power capable vessels thus reduced their calls in San Diego in order to fall below the five (5) or more calls per year fleet definition, thereby remaining in compliance with the shore power regulatory requirements. Such practice was not sustainable and, since that time, much of the District's growth in vessel calls has been by shore power capable vessel. In that same time frame, one line halted a 20-call per year homeport string, and other cruise lines that had left San Diego in the wake of the 2010 economic downturn were prevented from returning (since they lacked shore power capable vessels).

2. The 2016 General Rate Case Phase 2 Rate Changes

As detailed here and in the testimonies of SDG&E witnesses Cahill and Fang, given the special circumstances with shore power, the District and the cruise ships it serves would be unduly damaged by the upcoming sharp increase in rates described below, and current environmental policies leave little room to modify operations. As described by Dr. Borison, the Schedule A6-TOU rate, with high fixed and demand charges, creates significant challenges for shore power. Dr. Borison describes the likely fiscal and market impacts of the rate.

D. The Solution: AB 628 and the Energy Management Plan

Following the announcement of the 2016 GRC Phase 2 and the need to transition the District's cruise ship terminal's shore power account to a new rate structure, SDG&E and the District entered into discussions about the risks caused by this new structure. In particular, the District and SDG&E began examining a cruise-specific electricity rate to protect the local cruise business while meeting environmental requirements as established by CARB. The District and

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noting that these requirements do not override the 2010 rule that a shore power capable ship must use shore power when it is available. In other words, a cruise line cannot choose to forego using shore power during a port call because it has already met the 50%/70%/80% annual thresholds.

It is also worth noting that the District's Tenth Avenue Marine Terminal is also shore power capable. Dole Ocean Cargo Express has a weekly refrigerated container service to that terminal, and they utilize shore power when at berth.

[11] CCR, title 17, chapter 1 subchapter 7.5, § 93118.3(b)(3)(E)(2)

SDG&E entered into a Memorandum of Understanding (MOU) in April 2016 to further this effort.

During those early MOU discussions, the District and SDG&E identified AB 628[12] and the development of the EMP as the best opportunity to develop a partnership between SDG&E, the District and its tenants and stakeholders and to advance the District's CAP goals while increasing stability and predictability in the shore power electricity rate.

The outcome of the continued discussion was the EMP and the features now before the Commission. As an integral part of the EMP, SDG&E has partnered with the District in providing a competitive shore power rate for the District through the use of the EMP Discount. Such rate will be passed through to cruise lines calling in San Diego (on Schedule TOU- A), in recognition that a steep increase in shore power rates would result in a steep loss in the District's cruise business. The EMP Discount is described further below.

The MOU and proposed EMP also serve as a continuation of the District and SDG&E's long-standing EE LGP. SDG&E and the District recently entered into a five-year EE LGP Agreement to fund initiatives between January 2016 and December 2020. This agreement allocates $692,840 annually in reimbursable funds to continue the implementation of energy efficiency programs within the District's jurisdiction. In total, the Commission-approved LGP provides $3,464,200 in energy efficiency funding over the five year 2016-2020 program cycle and also supports the Green Port Program and implementation of the District's CAP specific to EE and the narrowly defined scope of the LGP agreement.

The EMP leverages the District's existing LGP to expand and build off of the energy efficiency-related measures already supported by SDG&E. The EMP proposal includes an EPP that is anticipated to be structured in a similar way as the LGP to ensure that District has dedicated resources to implement the proposed projects included in the EMP. The additional components of the proposed EMP expand beyond the energy efficiency- focused scope of the District's LGP Agreement to include clean transportation strategies for both on-road and off-road

[12] AB 628, Energy Management Plans for Ports and Harbor Districts (October 11, 2013), codified in Public Resources Code, chapter 13 § 25990.

vehicles and equipment, opportunities for clean energy generation projects, and energy storage opportunities, and to include projects that the District can pursue both independent of and in partnership with SDG&E.

V. DETAILED DISCUSSION OF SHORE POWER PROPOSAL AND JUSTIFICATION

A. Details of Plan

In order to ensure that the District's cruise ship shore power rate discount reflects the special features of the cruise industry, SDG&E and the District are using the EMP to implement the EMP Discount and advance additional initiatives to reduce District power usage and enhance its CAP. The proposed EMP Discount overcomes the risks and challenges mentioned in testimony. The rate stability and electricity cost certainty provided through the proposed rate discount is necessary to retain the District's cruise business and to facilitate the economic development that accompanies an expanding cruise industry.

The proposed EMP Discount sets the total energy charges assessed to the District's cruise ship terminal account to the applicable month's class average rate for the Medium/Large Commercial and Industrial customer class, currently around $0.20 per kilowatt hour. As described by Cynthia Fang in her testimony, this discount proposal provides the cruise ship terminal account with a transparent discount using a cost-based, "real time" TOU rate, while also mitigating the impact on the District as a high peak, low load factor electricity user, which is unavoidable at the current time given the existing CARB Regulations. Thus, this discount provides a financially feasible electricity rate for shore powering vessels, and thereby maintaining the large cruise-generated economic impacts to the San Diego region alongside the environmental benefits that shore powering provides to the State. As the adjusted rate is assessed per kilowatt hour (kWh) of electricity actually accrued to the cruise ship terminal account, the District will not be required to find a way of charging the cruise lines for shore power in months that they do not call at the District's terminals.

SDG&E's application and testimony provide a detailed explanation of how the rate will be managed and how costs will be recovered. The many letters of support attached to the

Application from elected officials, regional business organizations, and organized labor included in SDG&E's Application demonstrate widespread regional support for this plan.

B. Justification for Plan

1. There Is Currently No Alternative to Shore Power for Cruise Ships Calling in San Diego

As described above, cruise lines calling in San Diego five or more times per year must use shore power when they are at berth in order to comply with the CARB At-Berth Regulation. That means that other than choosing to call in San Diego less than five times per calendar year, there is no way for cruise lines to avoid paying for shore power at the SDG&E-set shore power rates. Given that, it is important that the shore power rates reflect the realities of the cruise market and are price competitive. Dr. Borison's testimony provides further details on the estimated cost increases to cruise lines.

2. The EMP Shore Power Rate Overcomes the Administrative and Business Challenges of the Schedule A6-TOU Rate

As detailed in this section and in the testimony of SDG&E witnesses, the Schedule A6-TOU Rate imposes various challenges to the District. The EMP Discount significantly helps to overcome some of these challenges as described briefly here by allowing the District to charge the cruise lines for shore power based on a per kWh rate and to not charge for electricity in months when electricity is not used.

Application of an unmodified A6-TOU rate on the District's Shore Power Account would render the District's current billing structure as obsolete and cause significant difficulty for the District to accurately and fairly distribute those costs among its cruise customers. Currently the District treats shore power as a pass-through cost billed directly to cruise lines for their energy use when calling at the District's cruise terminals. Without the EMP Discount, the District would need to somehow allocate both fixed and demand charges, as well as energy charges to its various cruise ship customers. A second potential billing challenge for the District is that not all cruise ships use the same amount of electricity. Larger cruise vessels use more power. At this time, one

of the three cruise lines utilizing shore power has a vessel 50% larger than the vessels deployed by the other two lines, and that larger vessel uses about 50% more electricity than the other ships.

The District does not possess the expertise to both estimate the amount of power that will be used by each vessel and then fairly allocate the fixed and demand charges among customers with different power usages (since the demand charges are based on peak usage). The District would have to estimate the number of visits and peak charge amounts in advance and would face a likely risk of considerable over or under collection. The District also lacks processes to recoup funds if it under charges or over charges cruise lines. In addition, this additional responsibility could require the District to undertake related business activities such as collections, escrow accounts etc. which it does not undertake today.

The Schedule A6-TOU rate also assesses fixed and demand charges even for months where cruises do not call at the District, meaning that the District gets charged for large fixed costs even during the months of June-August when there is no need for shore power. District cruise customers only use shore power during the cruise season of late September to late May, but the fixed and demand charges are assessed year-round. The District has no mechanism for collecting these charges from cruise ship lines that do not call at those times. The District's inability to pass through these costs to its cruise ship customers takes a currently simple administrative process (charging a cruise ship for shore power used while at berth), and turns it into something much more complex. The District must estimate what to charge the lines, but unless the estimates are perfect, the cruise lines will be under or over charged. The District would then need to contact them afterwards to collect or return funds, or set up an escrow account or other processes to manage such issues. The extreme variability of visits within a year is illustrated in Figure 4 below, which shows the variance in total calls and shore power calls by month for the 2015/16 and 2016/17 cruise seasons.

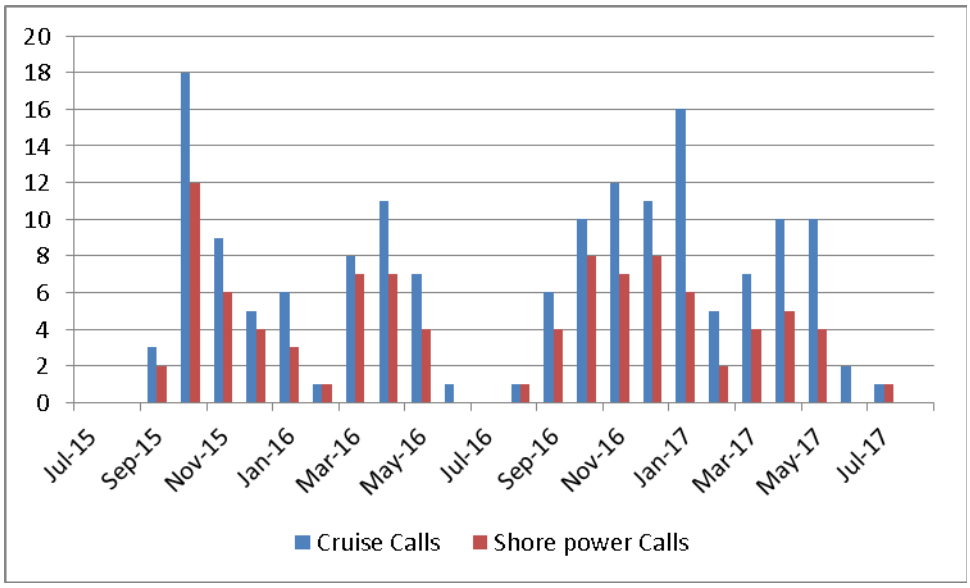

Figure 4: Port of San Diego total cruise calls and shore power cruise calls for the 2015/16 and 2016/17 cruise seasons

3. Cruise Lines Are Price Sensitive Such that Shore Power Rate Shocks Could Cause Them to Stop Calling in San Diego

As described by Dr. Borison, even small rate adjustments could cause a sizable shift in business at the District's cruise facility. If applied without the EMP Discount, the M/L C&I rate is predicted to result in a 40% drop in vessel calls with the potential for a death spiral. Thus, because of the high elasticity for cruise service and the need to spread fixed and demand charges among a declining number of cruise ship calls, a dramatic increase in electricity rates could result in a dramatic, and swift, loss of cruise business for the District, should the cruise lines determine that a redeployment of their ships is necessary.

4. Reductions in San Diego Cruise Volumes Would Have a Large Adverse Regional Economic Impact

A steep reduction in the number of cruise ship calls risks the solvency of the San Diego cruise industry. Although the District is a public entity charged with generating public benefits, it is also a self-supporting entity and thus needs to generate sufficient cruise volumes to pay for ongoing operating costs. The vessel call levels predicted by Dr. Borison in the event of a rate shock are unlikely to generate sufficient revenues to maintain a viable business.

A steep reduction in San Diego's cruise industry would also have significant negative consequences for the regional economy. The cruise industry is a critical economic engine for the

San Diego region. According to the most recent study released by BREA in 2016, the District's 2015 (calendar year) cruise business contributed a total of $82 million to the local economy and supported more than 650 jobs through servicing 77 cruise vessels.

This $82 million in economic impacts is notable because this figure was calculated near the trough in the District's cruise business in 2015. Since that time, the District's business has shown continued growth. For calendar year 2017, the District expects to service 88 cruise vessels, with an estimated economic impact of over $130 million and supporting over 900 jobs.

During 2017, 50 of the 88 cruise ship calls at the District's cruise terminals are expected to utilize shore power. These shore-powered calls are by the District's three largest cruise lines, and they are expected to generate over $75 million in regional economic impact. This is nearly 60% of the cruise businesses' economic impact for 2017. It is also important to note that the majority of the District's future cruise volume growth will come from these lines (using their shore powered vessels) or from new entrants that will also use shore powered vessels. The District's current growth trajectory depends on shore powered vessels, and thus also depends on regionally competitive shore power rates.

Any significant decrease in cruise business would have adverse economic impacts on the region given that the cruise industry is a large consumer of products manufactured and sold in San Diego. The 2015 Cruise Market Economic Impact Study by BREA found that the 77 cruises in calendar year 2015 had direct regional expenditures of nearly $47 million. Of that, over $17 million was in the wholesale and retail trade, $6.6 million in transportation and warehousing, and $3 million was in manufacturing. These figures do not include the $35 million in indirect and induced spending that takes place at many other regional businesses.

C. The District and SDG&E Will Collaborate to Address Demand Charges and Rate Management Through the EMP

Without the shore power rate discount proposed in SDG&E's Application and described in the EMP, the combination of the CARB At-Berth regulations and the significantly higher shore power rates that would be charged to the District under Schedule A6-TOU would drive many of the cruise lines out of San Diego. The shore power rate proposal contained in the EMP overcomes

these challenges, while other elements in the EMP provide SDG&E and the District with the means, tools, and time to identify additional methods for increasing the shore power load factor and reducing peak demand. These include proposals to research into battery technologies that would be used to reduce shore power peaks, thereby potentially reducing demand charges. In addition, the Port's bills will reflect the actual costs incurred through the use of shore-based power on a cost-based rate, less the discount, so the Port and SDG&E can collect information about how and when the Port experiences its highest demand peaks, which may inform better ways of managing these demand charges over time.

D. There Are Other Benefits of the EMP Which Are Dependent on Approval of the Shore Power Rate

While the combination of the CARB At-Berth requirement and the Schedule A6-TOU rate structure is problematic for the San Diego cruise industry, the change in cruise operating procedures is beneficial to the San Diego region through reduced air emissions and electricity usage. The implementation and support of shore based power through a discount enables the region to experience the environmental benefits from the reduced emissions, while at the same time retaining the economic benefits that the cruise industry brings to the region. As described below, the EMP builds on the cooperation between the District and SDG&E to incentivize projects that lead to greater energy efficiency, cleaner transportation, and new technologies to reduce air emissions. It also helps the District and SDG&E continue to serve as national leaders in environmental stewardship, and contains advanced technology proposals, such as a mobile battery storage solution for reducing cruise peak power usage.

The EMP is a carefully balanced set of proposals intended to both address the rate impact discussed in this testimony and to create innovative new programs that benefit the District, SDG&E and the community at large. It was negotiated to address a number of issues and each aspect is integral to the other components. Commission approval of the rate discount proposal and cost recovery requested pursuant to the EMP is directly tied to progress in the other areas.

VI. DISCUSSION OF OTHER ASPECTS OF THE EMP

The EMP contains elements critical to meeting the District's future environmental and operational efficiency needs while employing innovative proposals to advance long-term CAP goals. In addition to supporting the ongoing existence of the District's cruise industry, the proposed AB 628-compliant EMP also aligns with the State's broader objective of combating climate change through GHG reductions and energy regulations.

The EMP is structured as a living document with a five year planning cycle that provides flexibility to SDG&E and the District to reevaluate needs and progress in alignment with the CAP goals. The EMP would leverage and build on the District's LGP Agreement to expand funding opportunities beyond energy efficiency. The focus of the EMP project proposals are predominantly aimed at operational improvements and efficiencies associated with the District's Working Waterfront, although opportunities for future redevelopments will be evaluated over the five years of the proposed EMP. In addition to the shore power rate discount, the EMP also includes the following five proposals:

- Energy efficiency proposal;
- Clean transportation proposal;
- Advanced technologies proposals;
- Clean generation proposal; and
- Enhanced Partnership Program

SDG&E's Application for cost recovery for the shore power rate discount also includes requests for cost recovery for specialized energy efficiency measures and the Enhanced Partnership Program. As further described below, funding and approvals for the remaining proposals are being requested through separate applications appropriate to the proposals' scope.

A. Energy Efficiency Proposal

The EMP Energy Efficiency proposal includes a focus on increased energy efficiency opportunities unique to tenant operations with the potential to further reduce overall District electricity usage by 10 million kilowatt hours by 2021 (attributable to approximately 3,000 MT CO2e). Coupling standard energy efficiency programs with the proposal for savings from new

specialized measures, the EMP aims to offset the costs for tenants interested in retrofitting or replacing equipment as summarized below.

- **Industrial Process Load**: High-energy consuming equipment that supports industrial processes (e.g., sandblasting, product manufacture and testing);
- **Temporary Equipment**: Portable equipment regularly used on different projects at different District sites that may not be owned by host customer (e.g., welding equipment, air compressors, lighting and ventilation used aboard ships docked for repair);
- **Advanced Controls and Energy Dashboards**: Computer systems that display and manage the amount of energy consumption used in facilities and facilitate steps to control this consumption (e.g., advanced building management systems); and
- **Emerging Technologies**: New technologies that are not yet commercially available or are yet proven. (e.g., advanced sandblasting technology; temporary service control technology).

B. Clean Transportation Proposal (SB 350)

Senate Bill (SB) 350, the Clean Energy and Pollution Reduction Act (de León, Chapter 547, Statutes of 2015), was signed into law establishing new clean energy, clean air, and GHG reduction goals for 2030 and beyond, codifying the 40% below 1990 levels, and setting new ambitious targets for energy efficiency, renewable electricity, and authorizes utilities to undertake transportation electrification activities.[13] As an element of the EMP, SDG&E has already submitted a filing to the Commission pursuant to SB 350 that included a clean transportation proposal for areas located within the District consisting of the installation of 30 – 40 infrastructure components that support electric vehicle supply equipment (EVSE), load research meters and data loggers to obtain operational data and facilitate growth of Medium Duty/Heavy Duty (MD/HD) Electric Vehicles (EV), and electric forklifts. The filing also included a proposal to allow SDG&E to collect energy consumption and obtain a baseline data set with which to

[13] SB-350 Clean Energy and Pollution Reduction Act of 2015. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB350

analyze how to optimize Vehicle Grid Integration (VGI) for the MD/HD EVs and electric forklift markets.

C. Advanced Technologies Proposals #1 (Mobile Battery) and #2 (Infrastructure Update)

The Advanced Technologies Proposal #1 is to support the phased integration of a mobile battery storage solution to meet a portion of the projected needs of the cruise ship terminal and other tidelands-wide energy needs. If successful, this project has the potential to deploy a technology that would reduce shore power peak energy usage, thereby facilitating the eventual transition of the District to the full M/L C&I rate structure without discount.

This multi-phased approach includes a proposal for a pilot project, which, if successful, would be followed by an expanded project that could support future shore power requirements at multiple maritime terminals, grid needs, community-related or event energy needs, and future trends in the advancement of battery storage technologies.

The concept of a mobile battery storage asset was identified as an opportunity to provide other stackable benefits and value streams, allowing an energy storage system to be transported and deployed at more than one location depending upon need and the available capacity of the storage unit. By providing multiple concurrent benefits, the mobile battery storage proposal would provide an additional energy supply and storage opportunity for the cruise ship terminal and large-scale community events where typically generators are used on-site (therefore reducing criteria pollutants). This mobile storage proposal may also tie into the District's existing solar photovoltaic installation at the B Street Terminal to take advantage of the excess production that occurs during off-peak/non-cruise ship days, thus bundling two advanced technologies in one project.

The Advanced Technologies Proposal #2 includes load growth studies for three potential District redevelopment projects where SDG&E is forecasting significant electric load growth that may require distribution grid upgrades. In order to determine grid needs and technological advancements to support new development, SDG&E has proposed energy load growth studies at three District locations: Seaport Village, Harbor Island and Tenth Avenue Marine Terminal. The

proposed studies would evaluate required upgrades to the distribution grid and the integration of energy storage, solar and other emerging advanced technologies to meet energy requirements. Additional studies would be conducted in collaboration with District staff and tenants to understand the design elements necessary for a smart and efficient distribution grid to systematically meet growing needs. SDG&E proposes conducting a detailed economic and technology viability study for each identified location in support of these efforts.

The Advanced Technologies #2 proposal also aligns with the requirements of Assembly Bill (AB) 2868 Energy Storage.[14] AB 2868 serves as the initial framework for the Commission to direct regulated electric utilities to develop programs and file applications aimed at the deployment of distributed energy storage systems. In order "to achieve ratepayer benefits, reduce dependence on petroleum, meet air quality standards, and reduce emissions of greenhouse gases," AB 2868 focuses on deploying programs and investments with the state's three largest electrical corporations.[15] Guidance for the Commission program structure for AB 2868 is forthcoming, although Public Utilities Code section 2832.2(d)(2) indicates that "the [Commission] shall prioritize those programs and investments that provide distributed energy storage systems to public sector and low-income customers." SDG&E's proposal recognizes the District as a public-sector customer and cites that the District may qualify for participation in the AB 2868 program. The EMP specifically cites AB 2868 as an appropriate funding mechanism for potential energy storage components, and per AB 2868, such projects would be prioritized by the Commission because of their public sector projects status.

The District may independently pursue microgrids separate from those proposed by SDG&E as a cost savings measure and where resiliency and islanding may be necessary to further advance the District as a Strategic Port.[16] If the District does so, the District will document those efforts in future EMPs.

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[14] Public Utilities Code § 2832.2 *et. seq.* https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB2868

[15] Public Utilities Code § 2832.2(b).

[16] The Port of San Diego is designated as one of only 15 strategic commercial seaports in the United States through the National Port Readiness Network. For more information *see* https://www.marad.dot.gov/ports/national-port-readiness-network-nprn-2/.

D. Clean Generation Proposal

SDG&E's Clean Generation Proposal supports the development of clean generation at the District by leveraging existing programs and support services offered by SDG&E, including EcoChoice, EcoShare, the integration of planned behind-the-meter solar installations by the District and some of its tenants, and solar as part of Advanced Technologies Proposal #2 - Infrastructure Update.

E. Enhanced Partnership Program

SDG&E is proposing the creation of an Enhanced Partnership Program (EPP) to support the EMP. The intent of the EPP is to provide oversight, tracking, and reporting on the implementation of the EMP to ensure the goals of AB 628 to reduce GHG emissions and support economic development objectives are met. As such, the EPP proposal seeks incremental funding for the District and SDG&E to provide the resources needed for the five-year term for the first EMP in the amount of $2,460,985 for the District and $1,658,348 for SDG&E over the proposed five (5) year term for a total of $4,119,333 (In 2017 dollars without loaders or escalation factors), subject to the Commission's review and approval. This budget includes support for staff time, set-up and operations, consulting services, training/outreach, and other smaller budget categories over the proposed five (5) year term. The first EPP proposal requests the needed resources to support clean transportation, advanced technologies and clean generation proposals included in the EMP that are not otherwise supported in the current LGP Agreement. Continued coordination on the detailed components of the EPP, including specific roles and responsibilities and the framework of the program are to be jointly developed. EPP goals to be addressed include the following:

- On-going governance framework for EMP activities such as implementation, tracking and reporting;
- Future EMP planning, application filing and Implementation;
- A mechanism for inclusion of a broad stakeholder group; and

- Resources to allow the District to work on a broader range of important activities supporting the EMP, beyond the District's existing energy efficiency focused LGP Agreement, including grant writing.

Exhibit 1

Final Report

Economic Impacts of the San Diego Unified Port District in 2015

The Economics of Land Use

Prepared for:

San Diego Unified Port District

Prepared by:

Economic & Planning Systems, Inc.

December 20, 2016

Economic & Planning Systems, Inc.
One Kaiser Plaza, Suite 1410
Oakland, CA 94612-3604
510.841.9190 tel
510.740.2080 fax

Oakland
Sacramento
Denver
Los Angeles

www.epsys.com

EPS #161041

Table of Contents

Appendices

List of Figures

1. INTRODUCTION AND KEY FINDINGS

Introduction

The San Diego Unified Port District (District) retained Economic & Planning Systems (EPS) to prepare an updated economic impact analysis of operations on District property.[1] This study reflects economic activity in 2015 and relies on a methodological approach that is generally consistent with previous studies of the District. As was the case in prior economic impact studies, the results contained in this study reflect the work of three consultants and a significant level of Port District staff involvement.[2] Current estimates of economic impact reflect updated datasets and interviews conducted with selected District employers.

This economic impact study offers an evaluation of spending and employment attributable to the District. In addition to capturing the "direct" economic activities supported by the District, the analysis estimates "ripple" or "multiplier" effects. Ripple effects include "indirect" and "induced" spending that stems from economic activity on District property.[3] For example, businesses operating on District land commonly purchase inputs to production from within the County. In addition, household spending by employees whose jobs are attributable to the District is considered.

Background

The District is a public benefit corporation and regional government agency. It controls about 2,500 acres of land and almost 3,000 acres of water spread across its five-member city jurisdictions of Chula Vista, Coronado, Imperial Beach, National City, and San Diego. With control of more than 33 of the 54 total miles along the San Diego Bay, the District plays an important role in administering a unique maritime, visitor-serving, environmental, and recreational asset, while also protecting the Tidelands of San Diego Bay for the people who live, work, and visit there. The bay and its waterfront are essential elements of the San Diego geography, economy, and culture, serving as:

- A strategically located harbor for trade, cruise, and military uses;

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[1] See prior studies including (1) *San Diego Unified Port District: Economic Impact on San Diego County and the State of California,* Economic & Planning Systems in association with Martin Associates, and BREA, September 9, 2013 and (2) *Economic Impacts of the San Diego Unified Port District,* Economic & Planning Systems, February 25, 2015.

[2] In addition to work by EPS, Martin Associates prepared an analysis of marine terminals; Business Research & Economic Advisors (BREA) prepared a study of the cruise industry, and the District's Marketing and Communications Department provided District data and support.

[3] See *Overview of Input-Output Methodology* for a detailed description of "indirect" and "induced" effects.

- A workplace for marine cargo, shipbuilding and repair, commercial fishing, boat tours and other water-dependent industries;
- An important recreational and environmental asset for urban residents;
- A national and international destination for visitors and convention attendees; and
- A venue for special events, drawing hundreds of thousands of people to the waterfront for the July 4th Big Bay Boom, San Diego Bay Parade of Lights, and the San Diego Summer Pops series, to name just a few.

This study measures jobs and economic activity:

- Originating on District property in 2015
- Categorized into two industry groups:
  (1) Tourism and Commercial Activity
  (2) Industrial and Maritime Commerce
- Within the San Diego County economy.

By virtue of its size and responsibility for administering the scenic, strategic, and economically crucial San Diego bayfront, the District plays an important role in the regional economy and its provision of recreational opportunities and environmental stewardship. Through the San Diego Harbor Police Department, the District serves as a key public safety agency and partner to local, state and federal entities in the security of San Diego Bay and high-value assets that include maritime cargo terminals, major shipyards, military installations, San Diego International Airport, a convention center, and prominent visitor-serving establishments. To balance competing demands for scarce space along the bayfront, the District must allocate its resources among commerce, industry, navigation, fisheries, tourism, environmental needs, and recreational demands, responding to changing requirements on an ongoing basis.

As part of its effort to understand how the District can best utilize its assets for the benefit of the region, the District retained EPS to analyze the impacts businesses and other entities located within the District's jurisdiction have on the regional economy. The District commissioned similar studies in 2014, 2013, 2007, 2003, 1999, and 1992.

Scope of the Analysis

The study analyzes impacts by geographic area for a specific point in time and assesses impacts by type of establishment. The categorization of establishments is consistent with those used in previous Port District analyses. These categories have been continued in this report for comparability.

Geographic Area **Figure 1** provides a map of the land and water within the District's jurisdiction. The analysis examines all of the economic activity (revenues and jobs) that take place on, or are directly attributable to, land and water areas administered by the District, with the exception of military installations and the San Diego International Airport.[4]

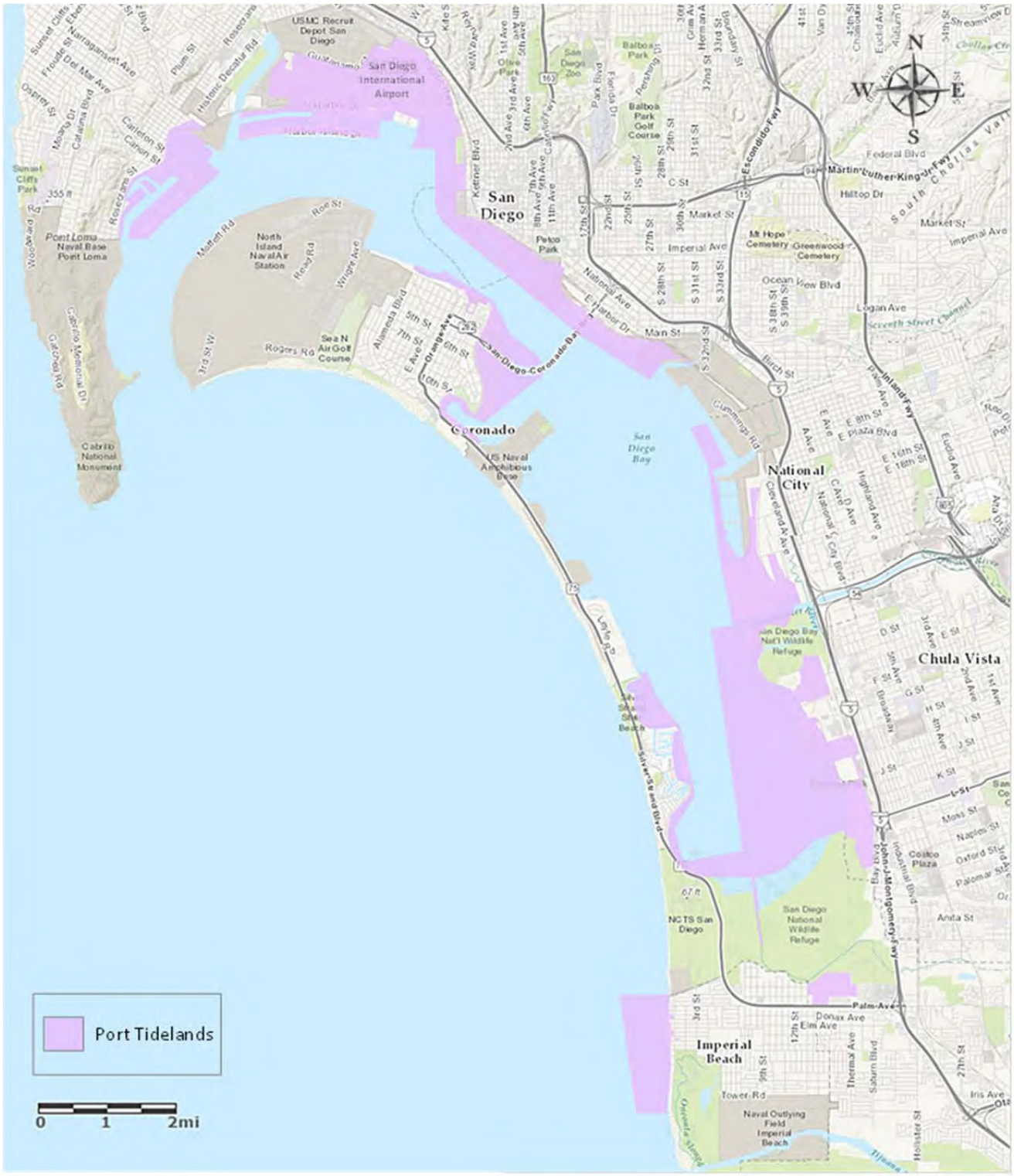
Timeframe The report focuses on economic activity in 2015, the last complete calendar year for which data was available at the start of the analysis.

Business Categories Previous District economic analyses have reported results for two categories of establishments: (1) Tourism and Commercial and (2) Industrial and Maritime. The Tourism and Commercial category includes retail, recreation and hospitality establishments, as well as most convention and cruise industry spending.[5] The Industrial and Maritime category includes maritime cargo operations, manufacturing, ship repair, marine terminal and cargo-related firms, and wholesalers.

[4] As a federal entity, military uses are not subject to local controls. Accordingly, the District has limited influence over economic activities on those lands. Note that the military's role in the regional economy is frequently examined by many sources, including a periodic report called the San Diego Military Economic Impact Study published by the San Diego Military Advisory Council (SDMAC). Also, the San Diego International Airport is not part of the analysis as it is governed by the San Diego County Regional Airport Authority, an agency that was created when the airport was separated from the Port District in 2003.

[5] Some cruise industry spending occurring on District land is categorized as Industrial and Maritime, depending on the business type at which the spending occurs.

Figure 1 Illustration of San Diego Unified Port District Jurisdiction



Note that San Diego International Airport and military establishments are not analyzed in this report.

Summary of Methodology

Economic Impacts Analysis Overview

The core economic impacts of the District are derived from the economic activities—sales and employment—that occur on District property. The analysis of these activities includes estimates of economic activity at private businesses, public sector entities, and other organizations located on District property. This on-site economic activity and associated employment on District land is a direct effect of the District. In addition, spending by cruise passengers, cruise ship crews, and convention center attendees that occurs off of District property also is a direct effect of the District. These off-site effects are attributable to the cruise ship terminal and the convention center, facilities sited on District property.[6]

The analysis relies on estimates of direct effects of the District to determine the total economic effect countywide. The analysis relies on IMPLAN, a highly regarded "Input-Output" model encompassing up-to-date economic information for San Diego County. IMPLAN analysis reveals industry-specific multiplier effects. These effects are categorized as indirect or induced effects.

- **Indirect Effects:** economic impacts on upstream businesses that supply inputs (goods and services) to production.
- **Induced Effects:** economic impacts that are generated by household expenditures made by employees.

Summary of Tasks

The research effort supporting this report included extensive data collection and analysis. Analytical methods were based on the approach developed in the 2011 and 2013 impact analyses. This 2015 analysis relies on updated District data and an updated economic model. The procedures for the analysis are described below.

Data Collection

- **Review District data.** The District provided tenant databases, information on gross sales (for tenants operating under leases which require sales reporting), and detailed information about its staffing. In addition, publicly available documents, including the District budget, the Port Master Plan, and statistics on the marine terminals and land use designations provided important background.
- **Conduct tenant research.** In addition to information provided by the District on tenants, EPS reviewed websites of major tenants, business news reporting, and other sources to obtain information about workers, sales, and customers targeted by Port tenants. EPS also conducted a number of phone interviews with major tenants to obtain additional data.

[6] The analysis avoids double counting of spending on District land by estimating cruise and convention center spending patterns within the region.

- **Assess business data.** EPS also reviewed datasets from proprietary business data provider Dun & Bradstreet. These data provided another source of information on sales and employment.

- **Evaluate economic indicators for the San Diego region.** To provide context for the economic impact information, EPS collected and analyzed selected economic metrics for the region.

Data Analysis, Integration, and Adjustments

- **Adjust data to avoid double-counting.** The analysis avoids double-counting of sales (double-counting would occur if the analysis counted a sale twice). For example, counting all of the sales from hotels within the District and counting all of the spending by convention center attendees and cruise passengers would result in a double count of sales (e.g., spending at hotels on District land). This analysis makes deductions accordingly.

- **Integrate marine terminals data**. Consistent with the methodology used in the 2011 EPS study of the District, this analysis relies on a stand-alone report focused on the marine terminals (Tenth Avenue and National City Terminals). Martin Associates produced the marine terminal study.[7]

- **Account for spending by convention attendees and cruise ship passengers and staff.** The direct effects of the convention center and cruise ship terminal include all spending by visitors and staff. Additional spending that occurs outside of the District jurisdiction is considered a direct effect. The study relies on data from an independent study of the cruise market and data from the San Diego Convention Center Corporation.[8]

Economic Modeling, Analysis, and Documentation of Findings

- **Develop and run economic model.** With roughly 600 tenants and subtenants, this task included defining the regional economic model, inputting information into the appropriate industry sectors, running the model, and evaluating results.

- **Draft findings based on review of model results.** This task included documenting the findings on impacts and segmenting results by appropriate industry groupings.

- **Compare results to 2013.** This analysis differs from the previous report in two primary ways: (1) 2015 data is the basis for the impacts and (2) the analysis relies on an updated regional model (IMPLAN/San Diego County 2014). This updated regional model includes current business data and economic multipliers.

- **Estimate tax revenue.** To estimate the level of tax revenue generated from establishments within the District, this analysis relies on tenant sales estimates and tax revenue data from the County Assessor's Office, as well as estimates from the Martin Associates cargo analysis.

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[7] The Local and Regional Economic Impacts of the Port of San Diego Marine Terminals, August 1, 2016.

[8] Economic Impact of the San Diego Cruise Sector 2015, Business Research & Economic Advisors (BREA) and San Diego Convention Center Corporation FY2015 Annual Report.

Key Findings

1. The District is an important economic driver in the region, directly supporting over 43,600 jobs and more than $5.4 billion in economic output in 2015.

Establishments located on District property are very diverse, with the District's portion of the San Diego bayfront encompassing:

- Cargo terminals and surface transportation infrastructure (roadways and railways) that processed almost **1.8 million tons of cargo in 2015;**[9]
- Major industrial users including shipbuilding and boat building and repair facilities such as **Continental Maritime**, **Marine Group Boat Works**, and **Shelter Island Boatyard**;
- A cruise ship terminal that is enjoying increased activity, with **77 cruise calls** generating a total impact of nearly **$600,000 per in-transit call** and almost **$2 million per turnaround call** in 2015;[10]
- Maritime activities ranging from commercial seafood enterprises such as the new **Tuna Harbor Dockside Market** and **Chesapeake Fish** to pleasure and charter boating operators like **Point Loma Sportfishing**, as well as hundreds of associated businesses, including boat dealers, wholesalers, and retail suppliers;
- Visitor attractions such as the **San Diego Convention Center** and **14 major hotels and resorts offering nearly 8,000 rooms**, along with visitor-oriented retail, restaurants, and recreation businesses.

These diverse economic activities support a broad range of employment opportunities. Employees at businesses and organizations within the District include manual laborers, machine operators, professional service providers, public servants, hospitality workers, and retail clerks, along with many other occupations found

Photo Credit: San Diego Unified Port District

[9] FY2015 data from Martin Associates.

[10] Calendar year 2015 data from BREA. An in-transit call is made by a ship during the course of its itinerary. During a turnaround call, passengers embark in and return to San Diego for their cruise.

throughout the Industrial & Maritime and Tourism & Commercial industry groups.

2. Including multiplier effects the District supported more than 68,000 jobs and about $8.3 billion in economic output in San Diego County during 2015.

In addition to direct effects attributable to the District, indirect and induced spending generated additional employment and sales within the San Diego County economy. These additional economic impacts contribute nearly 24,700 additional jobs and roughly $2.9 billion in output countywide. Overall, this analysis finds that approximately 1 in 30 San Diego County jobs and more than 2.5 percent of the San Diego County economy are attributable to the District. This study finds that the total economic impact of the District is about nine percent greater than in 2013. It is important to note, however, that the comparability of District impacts across time is affected by both the economic activity occurring within the District as well as business linkages, consumer spending patterns, and the makeup of the regional, national, and global economy.

Figure 2 Economic Impact of the District in San Diego County in 2015

Impact Type	Industrial & Maritime	Tourism & Commercial	Total
Direct Economic Impacts[1]			
Employment (jobs)	12,995	30,632	43,627
Labor Income (millions)	$866	$1,126	$1,992
Labor Income & Benefits Per Job	$66,609	$36,767	$45,656
Economic Output (millions)	$2,703	$2,722	$5,425
Indirect & Induced Impacts			
Employment (jobs)	11,442	13,237	24,679
Labor Income (millions)	$617	$674	$1,291
Economic Output (millions)	$1,001	$1,883	$2,884
Total Economic Impacts			
Employment (jobs)	24,437	43,870	68,306
Labor Income (millions)	$1,483	$1,800	$3,283
Economic Output (millions)	$3,704	$4,604	$8,309

[1] Includes roughly 35,600 on-site jobs and $4.8 billion in on-site direct output.

Source: Economic & Planning Systems; Port of San Diego; Martin & Associates; Business Research & Economic Advisors; IMPLAN Group

3. *Industrial and maritime commerce is a significant contributor to the District's economic impact, but tourism and commercial activity supports more jobs and economic output.*

Industrial and maritime activities are responsible for about 36 percent of the District's total employment effect and 45 percent of the District's total output effect within San Diego County. Tourism and commercial activity comprises 64 percent of jobs and 55 percent of the output generated countywide.

Figure 3 Employment Impacts by Industry Group

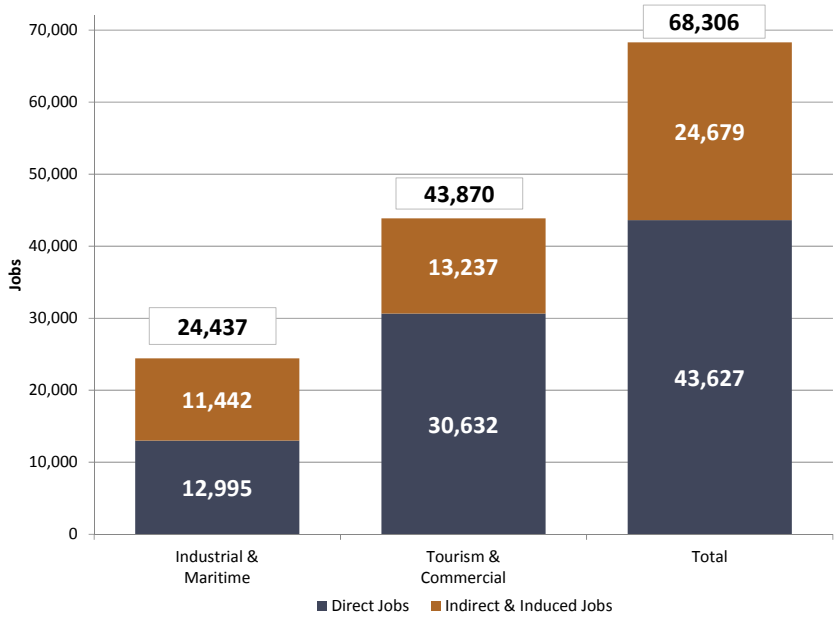
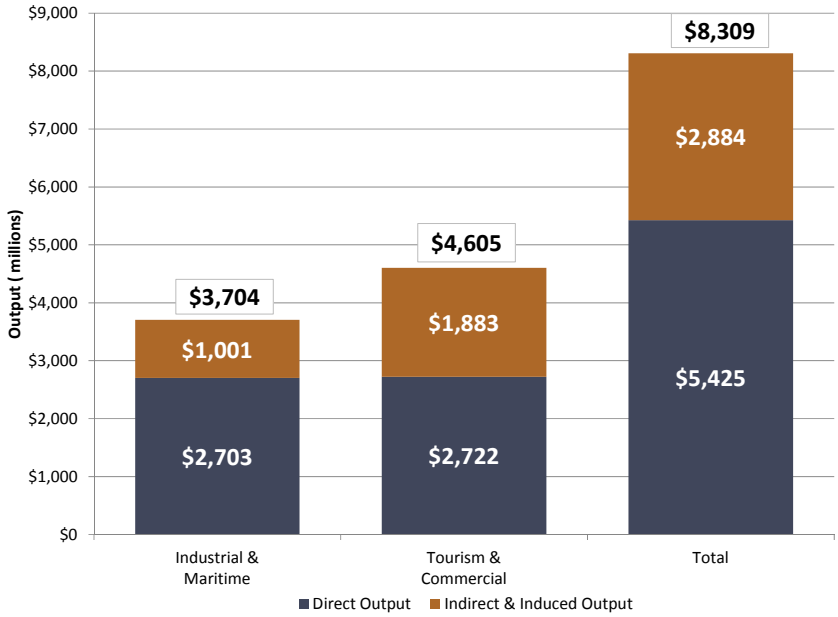


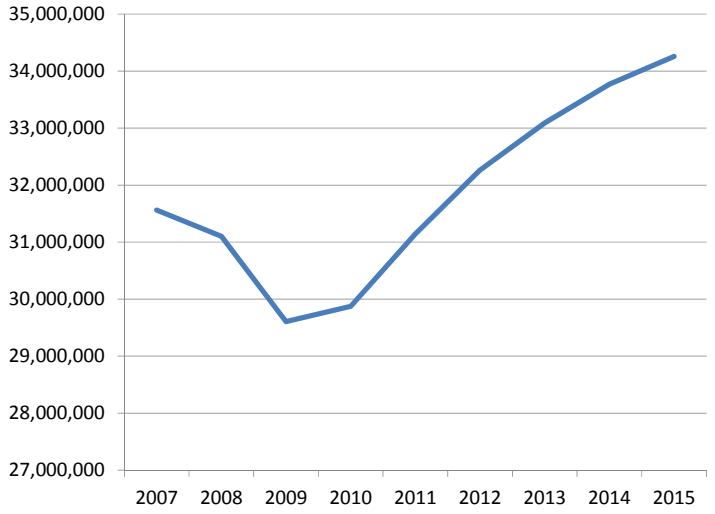
Figure 4 Economic Output Impacts by Industry Group



4. The growth in direct employment attributable to the District increased by about 10 percent between 2013 and 2015, while direct economic output increased by roughly six percent over the same time period.

San Diego tourism has been in recovery mode, with annual visitor volume increasing steadily since 2009 (see chart at right). This analysis finds that the tourism growth trend is observable within the District, with direct Tourism and Commercial jobs up 14 percent and associated economic output up four percent between 2013 and 2015. This growth includes hotels, recreation businesses, dining establishments, and retail, as well as general commercial activities that occur within the District boundary.

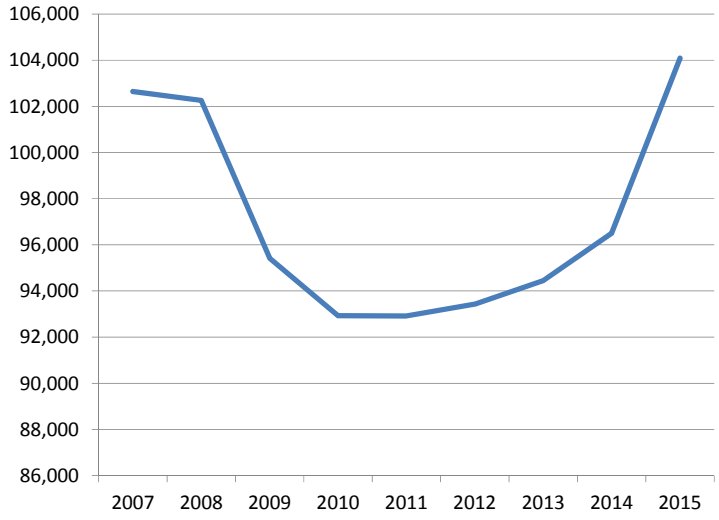
Visitor Volume in San Diego County 2007-15



Source: The San Diego Tourism Authority

Countywide, the manufacturing sector has been recovering from post-recession declines, with employment up about 10 percent since 2013. However, not all Maritime and Industrial businesses have enjoyed double digit growth rates. On District property, this analysis finds a similar increase in industrial and maritime employment activity. However, the closure and demolition of Dynegy's South Bay Power Plant and a dip in productivity (i.e., output per employee), among other factors, have contributed to a slower rate of growth in output within the District's Industrial and Maritime sector.

Manufacturing Employment in San Diego County 2007-15



Source: State of California Economic Development Department

Figure 5 Direct Employment Attributable to the District in 2013 and 2015

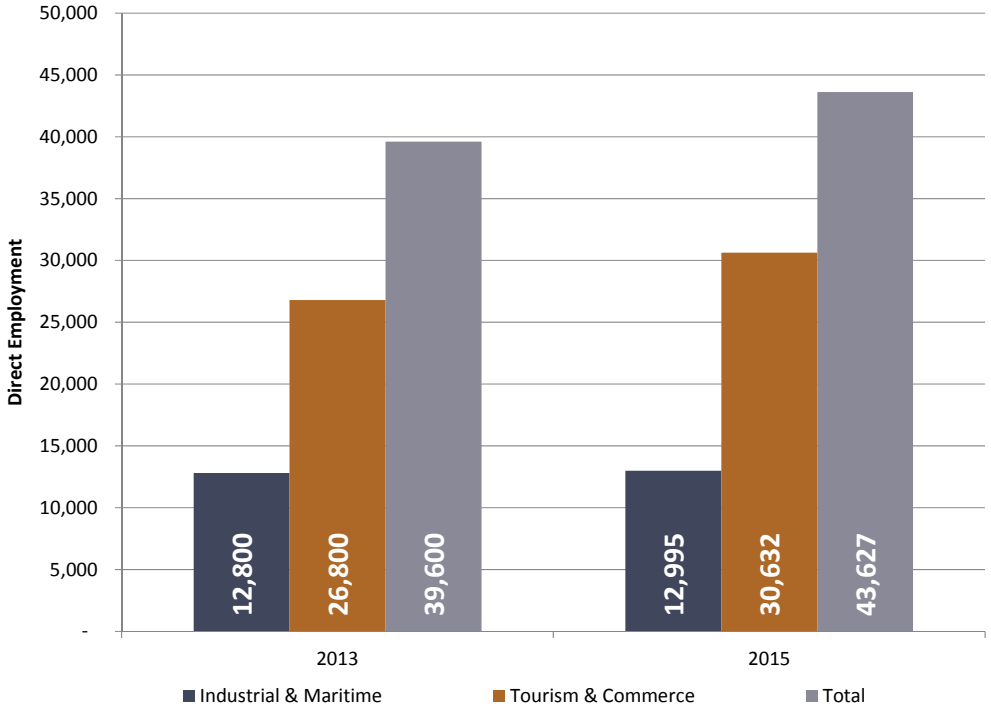
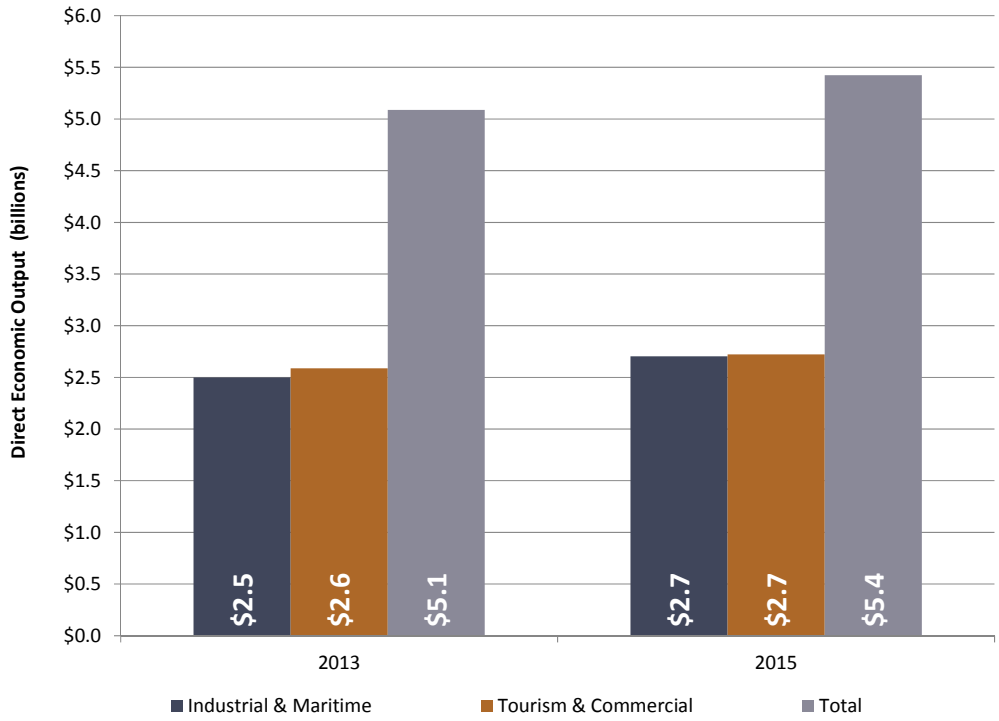


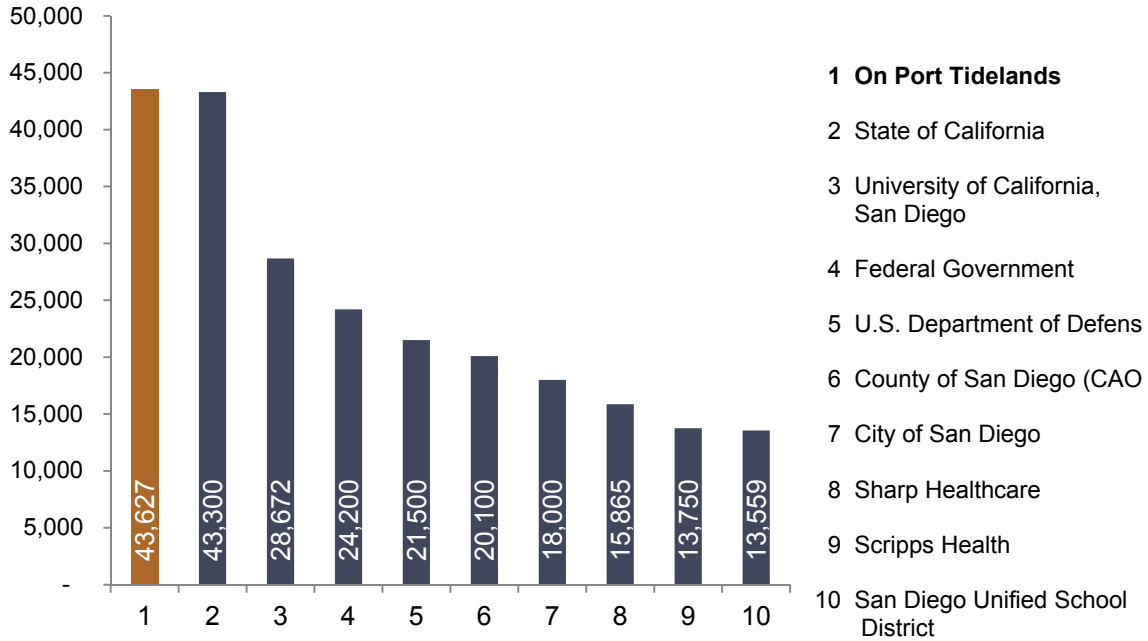
Figure 6 Direct Economic Output Attributable to the District in 2013 and 2015



5. If the jobs supported within the jurisdictional boundary of the San Diego Unified Port District were considered a single employment source, the District would be the largest employer in San Diego County.

The most significant employers in San Diego County include government agencies, universities, and health care institutions with multiple locations or campuses. Employment on District property ranks just above State employment in the County as well as above the University of California San Diego, San Diego County, Sharp Healthcare, Scripps Health, and others. Note that federal government employment counts vary widely depending on how on-base personnel are accounted for. The data source used in the figure below separates Department of Defense personnel from other federal employees and does not account for on-base personnel in the total.

Figure 7 Largest Employers in San Diego County



[1] Department of Defense employee count does not include personnel on bases

Source: San Diego Sourcebook 2014; Economic and Planning Systems, Inc.

6. Estimates of tax revenue generation directly attributable to economic activity within the District jurisdiction indicate that property, sales, hotel, and other taxes totaled more $130 million in 2015.

The analysis considered retail sales estimates and hotel revenue generation to calculate sales taxes and transient occupancy taxes (TOT). EPS also coordinated with the San Diego County Assessor's Office to determine property tax revenues, including possessory interest taxes paid by District tenants. The results indicate that TOT is the most significant source of tax revenue, followed by property tax. When cargo-related state and local tax revenue is included, the tax revenue estimate exceeds $130 million.

2. PORT DISTRICT OVERVIEW

Port District Tidelands and Submerged Lands

The San Diego Unified Port District was created in 1962 by the California State Legislature to serve as the San Diego Bay tidelands public steward. It is governed by a seven member Board of Port Commissioners, appointed by the District's constituent cities' elected bodies.[11] The District includes historic tidelands and submerged lands in the five member cities: Chula Vista, Coronado, Imperial Beach, National City, and San Diego. The District oversees two marine cargo terminals, two cruise ship terminals, 22 public parks, the Harbor Police Department, and the leases of master tenants all along San Diego Bay. The District is the fourth largest of the 11 ports in the State. See **Figure 9** for a map of the District and its subareas.

While the entire San Diego Bay Tidelands and submerged lands encompass about 4,400 acres of land and 10,500 acres of water, that area is divided among federal, state, local, and District control. Overall, the State of California is the largest owner, with about 43 percent of the total—almost all of which is water—followed by the District which controls 37 percent, and federal agencies with 20 percent. The District controls the largest portion of the land area, with almost 2,500 acres, which comprises 56 percent of the land total. The District also controls more than 60 percent of the Bay shoreline, with about 33 of the 54 total miles.

The District's nearly 5,500 acres of Tidelands and submerged lands and 33 miles of shoreline are spread among its five member cities, which include Chula Vista, Coronado, Imperial Beach, National City, and San Diego.

The District's land use activities are guided by a Port Master Plan which was prepared and adopted by the District's Board of Port Commissioners in accordance with the provisions of the California Coastal Act. Initially adopted in 1964 and updated numerous times since, the Plan provides proposed land and water use allocations that "reflect a balanced

> The Port is responsible for the development, operation, maintenance, control, regulation, and management of the tidelands and navigable waters of San Diego Bay for the promotion of commerce, navigation, fisheries, and recreation.
>
> - San Diego Unified Port District Compass Strategic Plan 2012-2017

Mission Statement

The San Diego Unified Port District will protect the Tidelands Trust resources by providing economic vitality and community benefit through a balanced approach to maritime industry, tourism, water and land recreation, environmental stewardship and public safety.

[11] The city councils of Chula Vista, Coronado, Imperial Beach and National City appoint one commissioner each and the San Diego City Council appoints three commissioners.

distribution of activities for the entire bay, evolved after considerable consideration of many factors and issues."[12]

In the Plan, over 40 percent of the District's land acreage is used for industrial purposes, while about 50 percent of the land is split roughly evenly among conservation (17 percent), commercial (16 percent), and public recreation uses (15 percent). About 10 percent is used for public facilities and military functions.

The vast majority of District water property (62 percent) is designated for conservation (38 percent) or public recreation uses (24 percent). The remaining 38 percent is split primarily among commercial (13 percent) and public facility uses (13 percent). Military and industrial uses make up only about 11 percent of the water acreage total. **Figure 8** presents the overall distribution of land uses within the Port Master Plan. Overall, including land and water areas, conservation is the most significant use, followed by industrial.

Figure 8 Port Master Plan Land and Water Use Allocation Summary

Use	Land Acreage		Water Acreage		Total Acreage[1]	
	Acres	% of Total	Acres	% of Total	Acres	% of Total
Commercial	457.9	16%	388.6	13%	846.5	15%
Industrial	1,158.7	42%	212.0	7%	1,370.7	24%
Public Recreation	407.5	15%	681.3	24%	1,088.8	19%
Conservation	485.3	17%	1,084.6	38%	1,569.9	28%
Public Facilities	241.4	9%	387.9	13%	629.3	11%
Military	25.9	1%	125.6	4%	151.5	3%
Total	**2,776.7**	**100%**	**2,880.0**	**100%**	**5,656.7**	**100%**

[1] Total planning acreage differs slightly from District-owned lands presented in the Master Plan

Source: Port Master Plan, Unified Port of San Diego (Print July 2015)

12 Port Master Plan

Subareas within the Tidelands

Prominent subareas within the Tideland include:

- Shelter Island and Harbor Island
- San Diego International Airport
- B Street and Broadway Piers /Centre City Embarcadero
- Tenth Avenue Marine Terminal
- National City Marine Terminal
- Coronado Cays/Chula Vista Bayfront
- Imperial Beach
- Silver Strand South
- Coronado Bayfront
- Military Areas

The section below provides an overview of each of these subareas. **Figure 9** provides an illustration of the prominent areas and land uses throughout the San Diego Bay Tidelands. Except for the Airport and the military installations, the general locations shown on the map and described below are included in the economic analysis.

District Subarea Profiles

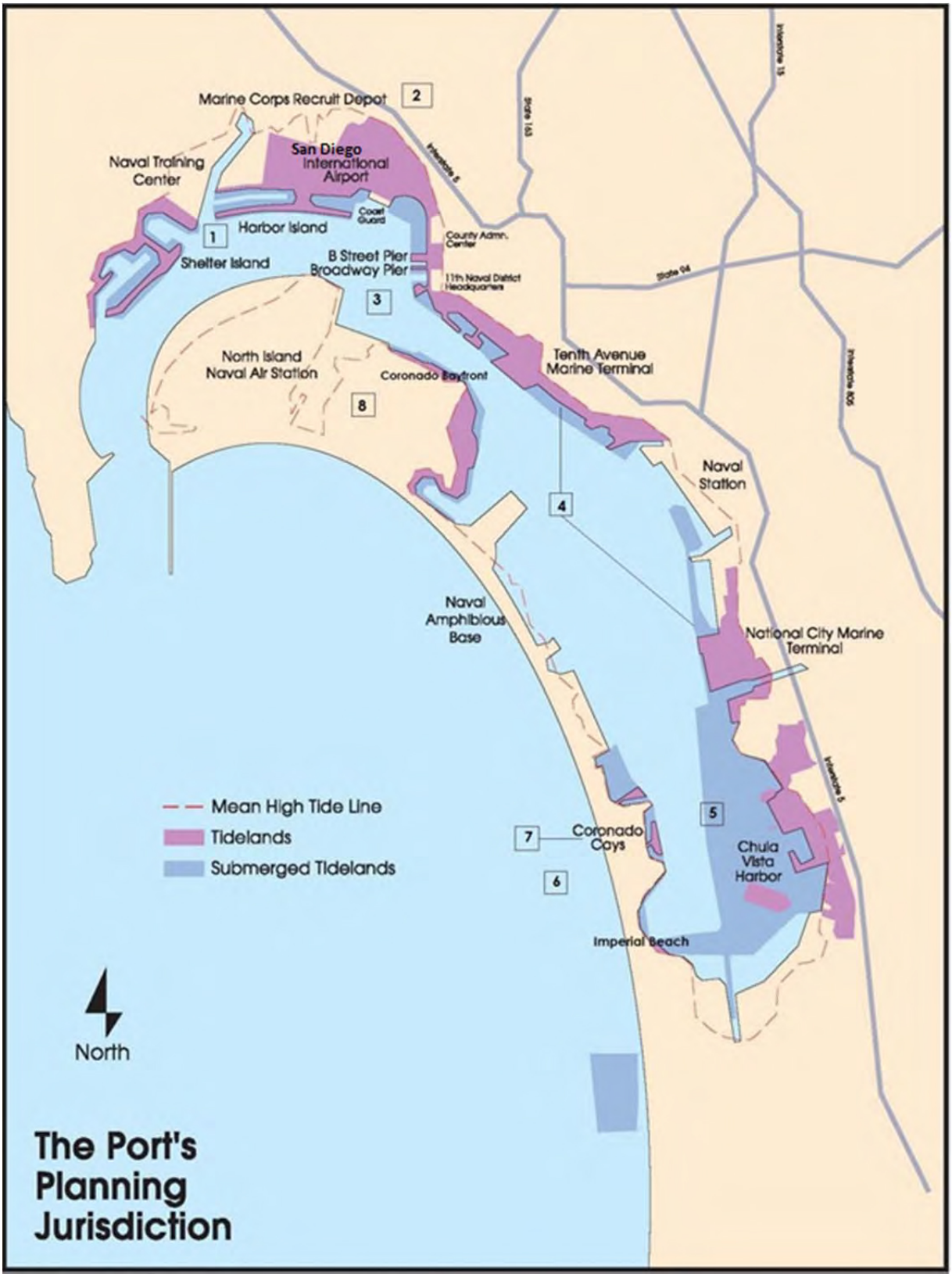
1. **Shelter Island and Harbor Island.** Tenants include hotels, restaurants, marinas, car rental agencies, commercial sport fishing, and other tourist-oriented entitles like boat tours.

2. **San Diego International Airport.** The San Diego County Regional Airport Authority was created in 2003 to manage the operations of the Airport. As the airport administration is controlled by another entity, economic impacts associated with the airport are not included in the Report.

3. **B Street and Broadway Piers/Centre City Embarcadero.** This area contains some of the most dense uses in the District including:

    - Miles of scenic pedestrian promenades
    - High-rise hotels with marina space
    - Cruise, boat excursion, and ferryboat facilities on and adjacent to the B Street and Broadway piers
    - The USS Midway Museum
    - Tuna Harbor with commercial fishing, the new Tuna Harbor Dockside Market and restaurant
    - Seaport Village and The Headquarters, centers for specialty shopping and dining
    - The San Diego Convention Center
    - Popular waterfront parks and open space

Figure 9 Illustration of Port District's Jurisdiction, with Sub-Areas Designated



Source: Port Master Plan

4. **Marine Cargo Terminals.** Tenth Avenue Marine Terminal (TAMT) is a 96-acre omni-terminal that handles refrigerated containers, bulk commodities, and break-bulk cargo. The Dole Fresh Fruit Company imports nearly 100 million bananas per month through this terminal. Bananas and other fresh fruit are distributed from TAMT to stores between San Diego and the Canadian border, and east to the Rockies. Free flowing bulk products handled at TAMT include bauxite, cement products, soda ash, and fertilizers used in the local construction industry. Break-bulk cargo such as steel and large finished products used in shipbuilding, windmill components, and turbines are handled in the open areas of the terminal. Liquid fuel tanks provide storage and distribution for petroleum products to the San Diego Regional Airport, as well as ocean-going vessels, tug boats and other support vessels. TAMT is also the homeport facility for the National Oceanic and Atmospheric Administration's (NOAA) research vessel, Reuben Lasker.

   National City Marine Terminal (NCMT) is the Port of San Diego's roll-on/roll-off terminal, operated by Pasha Automotive Services. NCMT processes automobiles and other rolling vehicles for import and export, including approximately one out of every 10 imported new cars sold in the US, as well as lumber for Southern California from the Pacific Northwest. Pasha Hawaii Transport Lines also moves automobiles, household goods, and other specialty cargo on bi-weekly vessel service between Hawaii and NCMT.

   Together the two marine terminals serve as one of 17 Strategic Ports in the United States under an agreement with the Department of Defense administered by the Department of Transportation. These facilities provide the port infrastructure and services to support the deployment of U.S. military equipment and vehicles during times of national emergency. Both terminals have on-dock rail capability with BNSF Railway.

5. **Coronado Cays/Chula Vista Bayfront.** This area is developed with parks, boat ramps, a recreational vehicle (RV) park, marinas, a boatyard, and a re-created wildlife habitat island.

6. **Imperial Beach.** This area contains largely recreation-oriented development, including the Imperial Beach Pier on the Pacific Ocean, Portwood Pier Plaza, ancillary restaurants, and retail stores.

7. **Silver Strand South.** This portion of Coronado—separated from the Coronado Bayfront by the Navy Amphibious Base—is occupied by a residential community with the Port-administered portion of the area largely comprised of commercial recreational uses (marinas), public parks, and other recreation uses.

8. **Coronado Bayfront.** The Port-administered areas of the Coronado Bayfront contain hotels, retail, piers, and public parks.

9. **Military Areas.** While most of the military uses along the waterfront are located on federal land (not District land), a small amount of District land (about 26 acres) is used by the U.S. Navy. Given the size and economic importance of the military presence in San Diego, many analyses have examined the economic contribution of this sector. In addition, local influence on these uses is limited. Therefore, the military uses on District property are not included in this analysis.

3. ECONOMIC IMPACTS METHODOLOGY

This chapter defines economic impacts, discusses the analysis methodology, details a selection of the major District users, and provides a detailed report of the results of the economic analysis. Information on tax revenues is provided in the next chapter.

Description of Economic Impacts

The core economic impacts of the Port District are derived from the economic activities—sales, employment, and operating expenditures (purchases of goods and services)—that occur on District property. The analysis of these activities includes estimates of on-site employment and/or sales (revenues) of businesses, not-for-profit organizations, and public sector entities. In addition, spending associated with ocean cruises and the convention center events, which both depend critically on District facilities, is a direct effect attributable to the District. Together, these economic activities constitute the direct effect of the District.

The next step in estimating economic impacts is accounting for the "ripple" or "multiplier" effects that result from the direct effects. The ripple effects are categorized as indirect or induced effects. Indirect effects are economic impacts on upstream businesses that supply inputs (goods and services) to production. Induced effects are economic impacts that are generated by the consumption expenditures of employees whose jobs are directly attributable to the District. In this analysis direct, indirect, and induced effects are defined as follows:

- The **Direct Effect** is the initial economic impact that is attributable to the District, including revenues and employment supported by business establishments located in the District and other first-round spending that would not occur but for the District (i.e., off-site direct effects from spending by cruise- and Convention Center-related visitors occurring off of District property).
- The **Indirect Effect** is a measure of the economic impacts generated by "upstream" industry-to-industry transactions that supply inputs to the production of goods and services consumed by businesses and other economic activities attributable to the District.
- The **Induced Effect** is a measure of the economic impacts generated when employees from the direct and indirect effects spend their labor income.
- The **Total Impact** is the sum of the direct, indirect, and induced effects. The total impact measures the overall impact of District activities on the San Diego economy.

This report measures economic impact using common economic metrics, including employment, labor income, and output as defined below.

- **Employment** measures the number of jobs, a count that includes part-time and full-time workers.

- **Labor Income** represents the payments to labor in the form of both wages or salaries and benefits paid by the employer (e.g., health, retirement benefits). It also includes proprietor income.
- **Economic Output** is equivalent to sales or revenues achieved by businesses and other employment entities.

Data Collection and Analysis

The goal of the data collection process was to quantify the direct impacts by collecting data on the number of employees and/or the revenue generated by business establishments located on Port Tidelands. The study also collected and analyzed expenditure data to quantify the economic impact of inflows of dollars into the County's economy from 1) business expenditures by cruise lines, 2) cruise passengers and crew expenditures, and 3) expenditures by visitors and organizers of events at the San Diego Convention Center.

Overview of Input-Output Methodology

Input-Output (I/O) analysis is premised on the concept that industries in a geographic region are interdependent in the sense that they purchase outputs from and supply inputs to other industries within and outside the region. For example, consider the implications of an operating expenditure by a hotel establishment. Hotels purchase goods from producers, who in turn purchase raw materials from suppliers. Thus, an increase/decrease in the demand for hotel services will stimulate an increase/decrease in output and employment in the interdependent secondary industries.

Regional economic impact analysis and I/O models provide a means to quantify economic effects stemming from a particular industry or economic activity. Specifically, I/O models produce quantitative estimates of the magnitude of regional economic activity resulting from some initial activity (e.g., hotel or manufacturing operations). I/O models rely on economic multipliers that mathematically represent the relationship between the initial change in one sector of the economy and the effect of that change on economic output, employment, and income in other industries. These economic data provide a quantitative estimate of the magnitude of shifts in jobs and revenues within a regional or state economy.

This study uses the IMPLAN model to analyze economic impacts generated by economic activities attributable to the San Diego Unified Port District in the San Diego Economy. IMPLAN (Impact Analysis for Planning) software is an I/O modeling system licensed by IMPLAN Group, LLC that utilizes data collected from several state and federal agencies, including the Bureau of Economic Analysis, Bureau of Labor Statistics (BLS), and the Census Bureau. The model is widely used in the U.S. for estimating economic impacts across a wide array of industries and economic settings.

4. ANALYSIS OF DIRECT ECONOMIC ACTIVITY

The analysis reflects data concerning five key facets of economic activity that are attributable to the District, including:

- Port Tenants (excluding cargo-related businesses);
- Marine Cargo Terminals;
- Cruise Terminal ;
- San Diego Convention Center; and
- Public Sector.

Figure 10 summarizes the direct effect of each of the District's primary economic contributors. The following narrative provides an overview of each of these economic drivers.

Figure 10 Summary of Direct Effects by Economic Activity

Economic Activity	Economic Output (millions)	Employment
District Tenants	$4,402	33,500
Marine Cargo	$234	1,596
Cruise Terminal*	$42	428
Convention Center*	$593	7,534
Public Sector	$154	569
Total	**$5,425**	**43,627**

* Additional impacts above those captured by District tenants.

District Tenants

Port tenants include a great diversity of businesses and organizations. The cargo terminals and surface transportation (trucks and railways) processed almost 1.8 million tons of cargo in 2015. Major cargo-related tenants include Dole Food Company and The Pasha Group (global logistics). Significant industrial users include shipbuilders and boat repair companies, as well as turbine manufacturers. Notable firms include BAE Systems, Solar Turbines, and National Steel and Shipbuilding Company. The cruise ship terminal located on District land supported 77 cruise calls and passenger throughput of 215,000 in 2015. Additionally, maritime activities ranging from commercial seafood enterprises such as Chesapeake Fish to pleasure and charter boating operators like Point Loma Sportfishing, as well as hundreds of associated businesses, including boat dealers, repair services, wholesalers, and retail suppliers operate on District land. Further,

visitor attractions such as the San Diego Convention Center and numerous hotels and resorts offer roughly 8,000 rooms, and visitor-oriented retail, restaurants, and recreation businesses also are located within the Port's jurisdiction. This analysis estimates direct economic output and employment associated with District tenants, excluding cargo-related tenants, at roughly $4.4 billion and 33,500 jobs.

Marine Cargo Terminals

The Port has two marine cargo terminals, Tenth Avenue and National City, which processed about 1.8 million tons of cargo in 2015 including automobiles, agricultural commodities, lumber, and wind energy components. Four key economic sectors are involved in providing cargo and vessel handling services at the Port, including:

- Surface transportation sector;
- Maritime services sector;
- Shippers/consignees using the Port; and
- Maritime Operations Department of the Port of San Diego.

The marine cargo terminals are key conduits for commodities important to many industries in San Diego and beyond. For example, containerized fruit distribution occurs by truck, with deliveries to grocery retailers throughout California and as far east as the Rocky Mountain region. Steel is used locally in shipbuilding as well as trucked into northern Mexico. Petroleum is distributed from the Tenth Avenue Marine Terminal by pipeline and by barge. Overall, this analysis estimates that these marine terminal activities support about $234 million in direct economic output and 1,600 direct jobs (excluding District employment and spending).

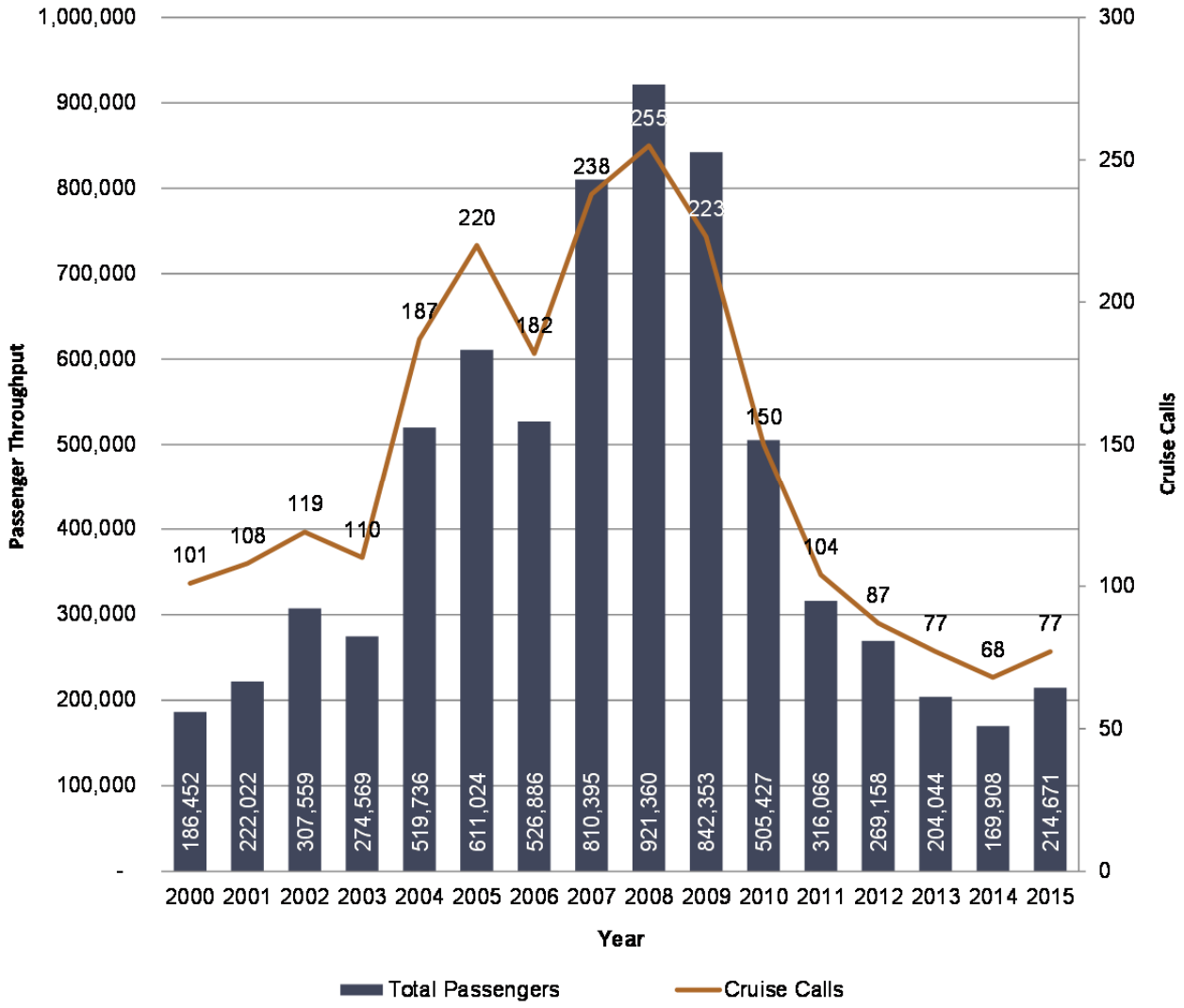
San Diego Convention Center (SDCC)

The San Diego Convention Center (SDCC) operates a world-class venue for hosting major conventions, trade shows, meetings and special events. According to its annual report for fiscal year 2015, SDCC hosted 172 events attracting over 808,000 attendees. The operations of SDCC as well as visitor expenditure (which include attendees, exhibitors and event organizers) generate significant economic impacts in the County's economy. This analysis considered 2015 expenditures by attendees, which included local outlays associated with event costs (exhibitors and event organizers), as reported by the SDCC. Based on these data, this analysis estimates the direct effect of the SDCC at approximately $590 million in spending and more than 7,500 jobs, in addition to the spending and jobs at businesses on District land.

Cruise Industry

The Port of San Diego receives cruise ships at the B Street Cruise Terminal and Broadway Pier locations. Cruise ships making calls in San Diego are still down from a high in 2008. However, 2014 appears to have been a cyclical low for the cruise industry as 2015 data reveal an uptick from that low. While there was the same number of cruise calls in 2015 as in 2013, throughput was up by more than 10,000 passengers (see **Figure 11**). In addition to passenger spending, the cruise industry generates economic impacts in San Diego County from expenditures made by cruise lines and ship crews. This analysis estimates that in addition to economic impacts enjoyed by District tenants, the cruise activity within the District directly supports $42 million in economic output and roughly 430 jobs in San Diego County.

Figure 11 San Diego Cruise Passengers and Cruise Calls 2000-2015



Source: Business Research & Economic Advisors and Port of San Diego

Public Sector

Direct public sector activity within the District primarily is composed of the employment and revenue of the San Diego Unified Port District itself. While the District leases significant land holdings to a number of public sector entities (e.g., local jurisdictions, San Diego County, State of California), the majority of the leases with public entities are for easements, parks, and rights of way. This analysis does, however, also include the Coronado Municipal Golf Course as a public sector economic activity located within the Tidelands. Including District operations and the golf course, this analysis estimates that $154 million in economic output and 569 jobs are directly attributable to public sector activities within the District jurisdiction.

5. TAX REVENUE EFFECTS

In addition to consideration of the economic benefits of the District, this analysis also estimates the fiscal revenues generated by District properties located within each of the member jurisdictions. This 2015 analysis relies on District tenant sales data to estimate sales tax and transient occupancy tax, and San Diego County Assessor data to estimate property tax revenue. The estimates are considered conservative as they do not reflect business-to-business sales and use tax, other business taxes (e.g., business license tax), or in most cases taxes paid by employees (e.g., income tax, property tax, sales tax).[13] Since the scope of the analysis is focused on economic activity directly tied to District land, the evaluation of taxes focused on those revenues most closely-related to the Tidelands.

To generate property tax estimates, the analysis took a deeper look at possessory interest taxes than previous fiscal impact studies conducted for the District. EPS corresponded with the County Assessor's office to determine total assessed value and property tax rates for each Tax Rate Area within the District jurisdiction. The results indicate that possessory interest taxes associated with tenant operations on port land are significant for the County and local entities. **Figure 12** summarizes 2015 tax revenues calculated by this analysis, including possessory interest tax revenue.

Overall, the analysis finds that 2015 tax revenue attributable to the District is in excess of $100 million, excluding cargo business activity. With cargo-related activity and associated tax revenue (estimated by Martin Associates), the total tax revenue attributable to the District is greater than $130 million. As shown in Figure 13, this tax revenue estimate is dramatically higher than had been estimated in prior years, primarily due to the inclusion of possessory interest tax in the analysis.

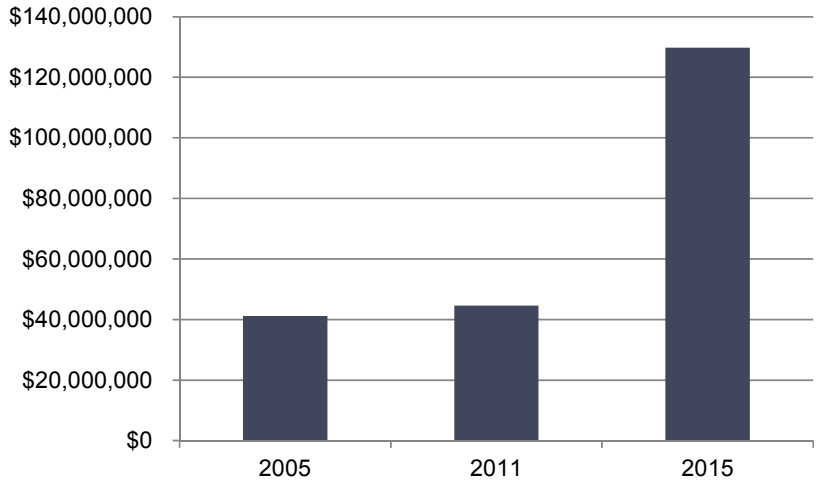
[13] Note that tax estimates associated with District cargo activities (prepared by Martin Associates) do include business and personal income tax.

Figure 12 Summary of 2015 Tax Revenues from District Tenants[14]

City	Property Tax	Sales Tax[1]	Transient Occupancy Tax	Total
San Diego	$37,912,000	$7,706,000	$44,781,000	$90,400,000
Chula Vista	$367,000	$440,000	$250,000	$1,058,000
Coronado	$2,023,000	$680,000	$4,544,000	$7,248,000
Imperial Beach	$2,000	$11,000	$0	$13,000
National City	$1,361,000	$138,000	$0	$1,499,000
Total	**$41,666,000**	**$8,975,000**	**$49,576,000**	**$100,216,000**
	Marine Terminal-Related State and Local Taxes[2]			**$29,583,000**
Grand Total				**$129,799,000**

[1] Sales tax estimates do not consider potential business-to-business tax revenue.
[2] State and local income tax burdens attributable to cargo activity (Martin Associates 2016)

Figure 13 Tax Revenue Estimate Comparisons



14 Table excludes nearly $30 million in state and local tax effects attributable to Carto activity reported by Martin Associates 2015.

APPENDIX A:

The Local and Regional Economic Impacts of the Port of San Diego Marine Terminals

Martin Associates

The Local and Regional Economic Impacts of the Port of San Diego Marine Terminals

Prepared for:

PORT OF SAN DIEGO

Marine Operations

687 Switzer Street

San Diego, CA 92101

Prepared by:

MARTIN ASSOCIATES

941 Wheatland Avenue, Suite 203

Lancaster, PA 17603

www.martinassoc.net

August 1, 2016

TABLE OF CONTENTS

I. INTRODUCTION AND OVERVIEW

The Port of San Diego is located along the southern coast of California. The maritime cargo operations at the Port consist of two public cargo terminals, Tenth Avenue Marine Terminal and National City Marine Terminal. These terminals handle containers, automobiles, fertilizer, soda ash, petroleum, steel, windmill components, and miscellaneous project cargo. Tenth Avenue and National City marine terminals handled nearly 1.8 million tons of cargo in FY 2015, which moved on more than 400 vessels and barges calling these marine terminals.

Containerized fruit and automobiles account for nearly 75% of the 1.8 million tons of cargo handled at the Port of San Diego marine terminals. The containerized fruit is imported from South and Central America and distributed via truck to grocery retailers as far east as the Rocky Mountain region and as far north as Vancouver, British Columbia. Automobiles are imported, processed, and distributed to car dealerships throughout the western United States via truck and rail. Autos are also exported via National City Marine Terminal.

With respect to dry bulk commodities, fertilizer is imported and distributed via truck throughout the southwest farming regions. Soda ash is mined in Trona, California and railed to Tenth Avenue marine terminal for export.

General cargo handled at the Port of San Diego marine terminals consists of steel, windmill components and miscellaneous project cargo. Steel is used locally in ship building as well as trucked into northern Mexico. Windmill components are distributed to windmill farms in Eastern California such as the Mojave Desert. A large portion of the miscellaneous project cargo is also used in the local shipbuilding operation. These products range from propellers to lashing bridges to other prefabricated vessel components. These components are trucked or barged from Tenth Avenue marine terminal to NASSCO. This underscores the importance of Tenth Avenue to NASSCO's operation.

Petroleum is barged to Tenth Avenue Marine Terminal and distributed directly at the terminal via pipeline or via barge to bunker vessels in the San Diego Bay.

The purpose of this economic impact analysis is to quantify the impact of the Port of San Diego marine terminals. The cargo moving via the Port's marine terminals has a far-reaching impact into the local and regional economies, and is not just limited to activity at the marine terminals. In addition to quantifying the impact of loading and off-loading the vessels, activity associated with importing and exporting products that are locally produced and consumed are also captured. These activities create jobs, income, revenue and taxes at every stage of the logistics supply chain. To measure the economic impacts of the Port of San Diego cargo operations, the study employs methodology and definitions that have been used by Martin Associates to measure the economic impacts of seaport activity at more than 500 ports in the United States and Canada. It is to be emphasized that only measurable impacts are

included in this study. In order to ensure defensibility, the Martin Associates' approach to economic impact analysis is based on data developed through an extensive interview and telephone survey program of the Port of San Diego cargo terminals and the firms providing cargo services within the Port of San Diego. Specific re-spending models have been developed for the San Diego area to reflect the unique economic and consumer profiles of the regional economy.

This study focuses on impacts generated during FY 2015, which uses the latest data available from the Port of San Diego. Impacts are estimated in terms of jobs, personal earnings, business revenue, and state and local taxes. In addition to the baseline impact estimates, computer models specific to each terminal operation have been prepared that can be used in evaluating the sensitivity of impacts to changes in tonnage, labor productivity, labor work rules, commodity mix, inland origins/destinations of commodities and vessel size.

1. IMPACT DEFINITIONS

The impacts are measured in terms of:

- Jobs [direct, induced, indirect and related users];
- Personal income;
- Business revenue; and
- State and local taxes.

Each impact measurement is described below:

- **Direct, Induced and Indirect jobs - *Direct jobs*** are those that would not exist if activity at the Port's cargo facilities were to cease. Direct jobs created by maritime cargo activity at the Port terminals are those jobs with the firms directly providing cargo handling and vessel services, including trucking companies, terminal operators and stevedores, members of the International Longshoremen's and Warehouse Union (ILWU), freight forwarders and customhouse brokers, vessel agents, pilots and tug assist companies.

  It is to be emphasized that these are classified as directly generated in the sense that these jobs would experience near term dislocation if the Port's marine terminals were closed. These jobs are, for the most part, local jobs and are held by residents of San Diego County.

- ***Induced jobs*** are jobs created in the San Diego area by the purchases of goods and services by those *individuals* directly employed by each of the Port's marine terminals. These jobs are based on the local purchase patterns of San Diego area residents. The induced jobs are jobs with grocery stores, restaurants, health care providers, retail stores, local housing/construction

industry, and transportation services, as well as with wholesalers providing the goods to the retailers.

- ***Indirect jobs*** are created throughout the San Diego area as the result of purchases for goods and services by the *firms* directly impacted by cargo activity, including the tenants, terminal operators and the firms providing services to cargo operations. The indirect jobs are measured based on actual local purchase patterns of the directly dependent firms, and occur with such industries as utilities, office supplies, contract service providers, maintenance and repair, and construction.

- ***Related shipper/consignee (related user) jobs*** are jobs with firms using the cargo terminals to ship and receive cargo. These jobs are not entirely dependent upon the port activity, but reflect the importance of the marine terminals to local firms. While the facilities and services provided in the seaport are a crucial part of the infrastructure allowing these jobs to exist, they would not necessarily be immediately displaced if marine cargo were to cease. These jobs include retail jobs primarily associated with containerized cargo and automobiles.

- **Personal income impact** consists of wages and salaries received by those directly employed by port activity, and includes a re-spending impact which measures the personal consumption activity in the San Diego area of those directly employed as the result of Port of San Diego cargo activity. Indirect personal income measures the wages and salaries received by those indirectly employed.

- **Business revenue** consists of total business receipts by firms providing services in support of the Port cargo. **Local purchases for goods and services** made by the directly impacted firms are also measured. These local purchases by the dependent firms create the indirect impacts.

- **State and local taxes** include taxes paid by individuals as well as firms dependent upon the Port of San Diego cargo activity.

2. METHODOLOGY

2.1. Data Collection

The impacts of the Port of San Diego marine terminals presented in this report were estimated based on telephone and personal interviews with 156 firms in the San Diego area. These firms represent the universe of the cargo businesses (with the exception of trucking and freight forwarding firms) operating at the Port of San Diego. Each firm surveyed provided Martin Associates with detailed employment levels (both full time and part time), annual payroll, local purchases and the residency of

the employees[1]. It is to be emphasized that a 98% response rate was achieved from these firms. Data was also collected from the Port of San Diego maritime division to estimate the FY 2015 impacts. This interview data was then used to develop an operational model for the San Diego area to measure the impacts generated by maritime activity at the Port of San Diego marine terminals.

2.2. Direct Impacts

The results of these 156 interviews were used to develop the baseline direct job, revenue, and income impacts for the cargo activity and for the economic sectors and job categories associated with each activity. This baseline survey data was also used to develop operational models that can be used to update the impacts of the marine cargo activity on an annual basis and to evaluate the impacts of changes in:

- Marine cargo tonnage, by commodity;
- Seaport labor productivity, and work rules;
- Modal distribution of marine cargo (what percent of the inland transportation of a commodity is truck versus rail), as well as the geographical distribution of each commodity; and
- Vessel/barge calls.

Also, the operational models can be used to evaluate alternative facilities expansion projects and new construction, such as a new or expanded marine cargo terminal.

2.3. Induced Impacts

Induced impacts are those generated by the purchases of the individuals employed as a result of cargo activity. For example, a portion of the personal earnings received by those directly employed due to activity at the Port's marine terminals is used for purchases of goods and services, both in-state, as well as out-of-state. These purchases, in turn, create additional jobs in the state of California, which are classified as induced. To estimate these induced jobs, a personal earnings multiplier for the San Diego region was developed from data provided by the Bureau of Economic Analysis, Regional Input-Output Modeling System. This income multiplier is used to estimate the total personal earnings generated in the state. A portion of this total personal earnings impact is next allocated to specific local purchases (as determined from consumption data for the San Diego Metropolitan Statistical Area, as developed from the U.S. Bureau of Labor Statistics, Consumer Expenditure Survey, 2013-2014). These purchases are next converted into retail and wholesale induced jobs in the regional economy.

[1] Individual firm data is collected by Martin Associates to develop the overall economic impact models. Company specific data is held strictly by Martin Associates and not provided to the Port or any other entity under the confidentiality agreement between Martin Associates and the individual companies.

Induced jobs are not estimated at lower levels of purchasing rounds (after the wholesale round) since it is not possible to trace with a sufficient degree of geographic accuracy where purchases at the remaining levels occur.

2.4. Indirect Impacts

Indirect jobs are generated in the local economy as the result of purchases by firms that are directly dependent upon activity at the Port's marine cargo terminals. These purchases are for goods such as office supplies and equipment, maintenance and repair services, raw materials, communications and utilities, transportation services and other professional services. To estimate the indirect economic impact, local purchases, by type of purchase, were collected from each of the 156 firms interviewed. These local purchases were then combined with employment to sales ratios in local supplying industries, developed from U.S. Bureau of Economic Analysis, Regional Input-Output Modeling System for the San Diego region. These jobs to sales ratios capture the numerous spending rounds associated with the supply of goods and services. Special care has been exercised to avoid double counting the indirect impacts, and to specifically include only the expenditures by the directly dependent firms that are, in fact, local.

2.5. Related Impacts

Related impacts measure the jobs with shippers and consignees moving cargo through the Port of San Diego marine terminals. ***Related jobs are not dependent upon the Port marine terminals to the same extent as are the direct, induced, and indirect jobs. It is the demand for the final products which creates the demand for the employment with these shippers/consignees, not the use of San Diego terminals, and therefore these firms can and do use other ports.*** Related impacts for the Port facilities were estimated by multiplying the value of the cargo moving via the marine terminals with jobs to sales ratios specific to the exporters and importers.[2]

2.6. Tax Impacts

The tax impacts include state and local taxes collected from all sources, both personal and business taxes. The state and local per capita income tax burdens (developed by the Tax Foundation for the state of California) are applied to the total direct, induced and indirect income impacts to estimate total state and local taxes created by activity at the Port of San Diego marine terminals.

[1] The value of cargo moving via the marine terminals was determined from USA Trade OnLine, while the ratios of jobs to sales data for related California exporters and importers were developed from data supplied to Martin Associates by the Bureau of Economic Analysis, Regional Input-Output Modeling System.

3. SUMMARY OF RESULTS

Exhibit I-1 provides a breakdown by cargo results for the economic impact analysis of the Port of San Diego marine terminals.

Exhibit I-1: FY 2015 Economic Impact of Port of San Diego Marine Terminals

	ECONOMIC IMPACTS
JOBS	
DIRECT	1,632
INDUCED	1,178
INDIRECT	406
TOTAL	3,216
PERSONAL INCOME/LOCAL CONSUMPTION ($1,000)	
DIRECT	$92,786
RE-SPENDING/LOCAL CONSUMPTION	$145,321
INDIRECT	$21,391
TOTAL	$259,498
BUSINESS REVENUE ($1,000)	$268,835
STATE AND LOCAL TAXES ($1,000)	$29,583
LOCAL PURCHASES ($1,000)	$55,802
RELATED USER IMPACTS	
USER JOBS	11,537
TOTAL VALUE OF OUTPUT ($1,000)	$1,580,164
USER INCOME ($1,000)	$576,546
USER STATE/LOCAL TAXES ($1,000)	$65,726

Totals may not add due to rounding

In FY 2015, the Port of San Diego marine terminals supported 14,753 jobs in the state of California. Of these jobs, 1,632 jobs are directly created by port activities, while another 1,178 induced jobs are generated in the San Diego area as a result of local purchases made by those directly employed due to Port of San Diego marine cargo activity. There are 406 indirect jobs supported in the San Diego region as the result of $55.8 million of local purchases by directly dependent firms. Additionally, cargo

moving via the Port of San Diego marine terminals supports 11,537 related jobs throughout the state of California and western United States. The majority of these jobs are associated with the retail of containerized fruit and automobiles.

The 1,632 direct jobs received $92.8 million of direct wage and salary income, for an average earning of $56,854 per direct employee. This compares to an average wage throughout the state of California of $55,260 in 2015.[3] As a result of local purchases with this $92.8 million of direct wages and salaries, an additional $145.3 million of income and local consumption expenditures were created in the state of California. It is this re-spending impact that supported the 1,178 induced jobs.[4] The indirect job holders received $21.4 million in personal income. In total, $836.0 million of personal income was supported by Port of San Diego marine cargo operations, including the $576.5 million received by those employed with the related users of the Port.

Local businesses received $268.8 million of sales revenue from providing services to the marine cargo activity, however this does not include the value of the cargo moving via the Port. The cargo activity at the Port created an additional $1.6 billion of related economic output in the state.

As a result of the cargo activity at the Port of San Diego marine terminals, a total of $95.3 million of state and local tax revenue was generated.

The total economic value of the marine cargo and vessel activity at the Port of San Diego is estimated at nearly $2.0 billion. The total economic value consists of monetary measures that are independent of each other and combining these measures does not result in double counting of the impacts. This includes the $268.8 million of direct business revenue received from businesses providing cargo and vessels services at the port and moving the cargo to and from inland destinations and origins; the $145.3 million of re-spending and local personal consumption impact; and the $1.6 billion of value of output supported by the related users. It is to be emphasized that the $1.6 billion of output with related users would not disappear from the U.S. economy should the cargo move through another port, as it is the demand for the export and import cargo that drives the value of the cargo and generates the user economic value. If the cargo were to move to another port, the logistics cost of moving the imports and exports would increase, but the value would still be generated in other regions and/or other states due to the demand for the export and import products; however, the $268.8 million of direct business revenue and the $145.3 million of re-spending and local consumption expenditures would be lost from the local economy. The related economic value demonstrates the magnitude of influence of

[3] U.S. Bureau of Labor Statistics, May 2015 State Occupational Employment and Wage Estimates California

[4] The induced income impact also includes local consumption expenditures and should not be divided by induced jobs to estimate the average salary per induced job. This re-spending throughout the region is estimated using a regional personal earnings multiplier, which reflects the percentage of purchases by individuals that are made within the state. Hence, the average salary would be overestimated.

the Port of San Diego marine terminals at a given point of time. It is to be emphasized that these components of the total economic value are non-additive.

The last economic impact study of the Port of San Diego was conducted in 2012. This study was conducted by Martin Associates and uses the same methodology as the current study. Therefore, direct comparisons can be made. Between CY 2012 and FY 2015, cargo activity at the Port's marine terminals increased by nearly 400,000 tons. As a result, the overall economic impact of the port operations increased. Direct, induced and indirect jobs grew by 537 jobs, and overall economic value of the Port grew from $1.3 billion to nearly $2.0 billion.

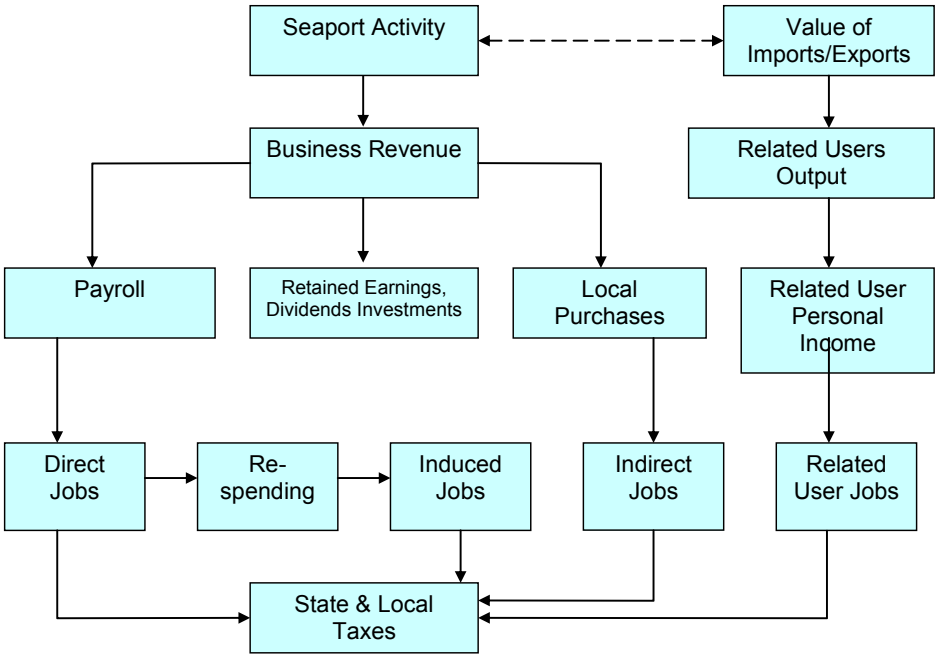
In summary, there are 1,632 jobs in the San Diego region that are directly dependent on the cargo activity occurring at the Port of San Diego marine terminals. The total contribution to the state's economy, including value of economic activity and re-spending is nearly $2.0 billion. Finally, as noted, the directly generated jobs receive an average annual salary of $56,854, which is slightly greater than the average state-wide annual salary in California.

The balance of the report describes in detail the impacts created by maritime cargo operations at the Port of San Diego.

II. ECONOMIC IMPACTS OF MARITIME CARGO ACTIVITY

Waterborne cargo activity at a seaport contributes to the local and regional economy by generating business revenue to local and national firms providing vessel and cargo handling services at the marine terminals. These firms, in turn, provide employment and income to individuals, and pay taxes to state and local governments. Exhibit II-1 shows how activity at marine terminals generates impacts throughout the local, state and national economies. As this exhibit indicates, the impact of a seaport on a local, state or national economy cannot be reduced to a single number, but instead, the seaport activity creates several impacts. These are the revenue impact, employment impact, personal income impact and tax impact. These impacts are non-additive. For example, the income impact is a part of the revenue impact, and adding these impacts together would result in double counting. Exhibit II-1 shows graphically how activity at Port of San Diego marine terminals generate the four impacts.

Exhibit II-1: Flow of Economic Impacts Generated by Marine Activity



At the outset, activity at the port generates business revenue for firms which provide services. This business revenue impact is dispersed throughout the economy in several ways. It is used to hire people to provide the services, to purchase goods and services, and to make federal, state and local tax

payments. The remainder is used to pay stock-holders, retire debt, make investments, or is held as retained earnings. It is to be emphasized that the only portions of the revenue impact that can be definitely identified as remaining in the local economy are those portions paid out in salaries to local employees, for local purchases by individuals and businesses directly dependent on the seaport, in contributions to state and local taxes, in lease payments to the Port of San Diego by tenants, and wharfage and dockage fees paid to the Port.

The employment impact of seaport activity consists of four levels of job impacts.

- ***Direct employment impact*** -- jobs directly generated by seaport activity. Direct jobs generated by marine cargo include jobs with railroads and trucking companies moving cargo between inland origins and destinations and the marine terminals, longshoremen and dockworkers, steamship agents, freight forwarders, stevedores, etc. It is to be emphasized that these are classified as directly generated in the sense that these jobs would experience near term dislocation if the activity at Port of San Diego marine terminals were to be discontinued.

- ***Induced employment impact*** -- jobs created throughout the local economy because individuals directly employed due to seaport activity spend their wages locally on goods and services such as food, housing and clothing. These jobs are held by residents located throughout the region, since they are estimated based on local and regional purchases.

- ***Indirect jobs*** -- are jobs created locally due to purchases of goods and services by firms, not individuals. These jobs are estimated directly from local purchases data supplied to Martin Associates by the companies interviewed as part of this study, and include jobs with local office supply firms, maintenance and repair firms, parts and equipment suppliers, etc. It is to be emphasized that special care was taken to avoid double counting, since the current study counts certain jobs as direct (i.e., trucking jobs, jobs with railroads, jobs with insurance companies and admiralty law firms, etc.) which are often classified as indirect by other approaches, notably the input/output model approach.

- ***Related shipper/consignee (related user) jobs*** are jobs with firms using the cargo terminals to ship and receive cargo. These jobs are not entirely dependent upon the Port activity, but reflect the importance of the Port to local firms. While the facilities and services provided in the seaport are a crucial part of the infrastructure allowing these jobs to exist, they would not necessarily be immediately displaced if marine cargo at the Port of San Diego were to cease. These jobs include retail jobs associated primarily with containerized cargo and automobiles. It is important to note that these shippers/consignees also use other ports and are not completely dependent upon the Port of San Diego. The level of

employment with these firms is driven by the demand for the firms' products, not because the Port of San Diego is used. Therefore, these related jobs are not dependent upon port activity, and their degree of dependence on the Port of San Diego is much less than the other components of the job impact.[5]

The personal earnings impact is the measure of employee wages and salaries (excluding benefits) received by individuals directly employed due to seaport activity. Re-spending of these earnings throughout the regional economy for purchases of goods and services is also estimated. This, in turn, generates additional jobs -- the induced employment impact. This re-spending throughout the region is estimated using a regional personal earnings multiplier, which reflects the percentage of purchases by individuals that are made within the San Diego region. The re-spending effect varies by region -- a larger re-spending effect occurs in regions that produce a relatively large proportion of the goods and services consumed by residents, while lower re-spending effects are associated with regions that import a relatively large share of consumer goods and services (since personal earnings "leak out" of the region for these out-of-regional purchases). The direct earnings are a measure of the local impact since they are received by those directly employed by seaport activity.

Tax impacts are payments to the state and local governments by firms and by individuals whose jobs are directly dependent upon and supported (induced jobs) by activity at the marine terminals.

1. ECONOMIC IMPACT STRUCTURE

Economic impacts are created throughout various business sectors of the state and local economies. Specifically, four distinct economic sectors are impacted as a result of activity at the marine terminals. These are the:

- Surface Transportation Sector;
- Maritime Services Sector;
- Related Shippers/Consignees Sector; and
- Port of San Diego Maritime Division.

Within each sector, various participants are involved. Separate impacts are estimated for each of the participants. A discussion of each of the economic impact sectors is provided below, including a description of the major participants in each sector.

[5] The related jobs, income, value of output and taxes should not be used when evaluating the incremental economic impacts of specific port projects or the impacts of changes in cargo volume. These related impacts are net of the direct, induced and indirect impacts generated by port activity.

1.1. The Surface Transportation Sector

The surface transportation sector consists of both the railroad and trucking industries. The trucking firms and railroads are responsible for moving the various cargoes between the seaport terminals and the inland origins and destinations.

1.2. The Maritime Services Sector

This sector consists of numerous firms and participants performing functions related to the following maritime services:

- Maritime Cargo Transportation;
- Vessel Operations;
- Cargo Handling; and
- Federal, State and Local Government Agencies.

A brief description of the major participants in each of these four categories is provided below:

- Maritime Cargo Transportation

  Participants in this category are involved in arranging for inland and water transportation for export or import freight. The freight forwarder/customs broker is the major participant in this category. The freight forwarder/customs broker arranges for the freight to be delivered between the terminals and inland destinations, as well as the ocean transportation. This function performed by freight forwarders and customshouse brokers is most prevalent for general cargo commodities.

- Vessel Operations

  This category consists of several participants. The steamship agents provide a number of services for the vessel as soon as it enters the port. The agents arrange for medical and dental care of the crew, for ship supplies as well as payment of various expenses including port charges (where applicable). The agents are also responsible for vessel documentation. In addition to the steamship agents arranging for vessel services, those providing the services include:

  - Chandlers - supply the vessels with ship supplies (food, clothing, nautical equipment, etc.);

- Towing firms - provide the tug service to guide the vessel to and from port;
- Vessel and barge crewmembers – those individuals aboard the vessels and barges to and from port;
- Pilots - assist in navigating the vessels to and from Port of San Diego marine terminals;
- Bunkering firms - provide fuel to the vessels;
- Marine surveyors - inspect the vessels and the cargo; and
- Shipyards/marine construction firms - provide repairs (either emergency or scheduled) and seasonal lay-ups as well as marine pier construction and dredging.

- Cargo Handling

  This category involves the physical handling of the cargo at the terminals between the land and the vessel. Included in this category are the following participants:

  - Longshoremen & dockworkers - include members of the International Longshoremen and Warehouse Union (ILWU), as well as those dockworkers with no union affiliation that are involved in the loading/unloading of cargo from the vessels and barges, as well as handling the cargo prior to loading and after unloading;
  - Stevedoring firms - manage the longshoremen and cargo-handling activities;
  - Cargo terminal operators - provide services to operate the maritime terminals, track cargo movement and provide security where cargo is loaded and off-loaded, as well as the petroleum terminal and pipeline operators which includes petroleum tank farm operations; and
  - Warehouse operators - store cargo after discharge or prior to loading and consolidate cargo units into shipment lots. In many cases the freight forwarders and consolidators are also involved in warehousing activity.

- Government Agencies

  This service sector involves federal, state and local government agencies that perform services related to cargo handling and vessel operations at the Port. Department of

Homeland Security (DHS), which includes (but is not limited to) Customs and Border Protection (CBP), U.S. Immigration and Customs Enforcement (ICE) and U.S. Coast Guard, and the U.S. Army Corps of Engineers, are involved.

1.3. Related Shipper/Consignees

Related jobs consist of jobs with related shippers/consignees shipping and receiving cargo through the Port terminals. Only the user industry activity that can be linked to the movement of cargo (either raw materials or finished products) through the Port of San Diego is considered in this related user impact.

1.4. Port of San Diego Maritime Division

The Port of San Diego Maritime Division includes those individuals whose purpose is to oversee maritime cargo activity.

2. COMMODITIES INCLUDED IN THE ANALYSIS

A major use of an economic impact analysis is to provide a tool for port development planning. As a port grows, available land and other resources for port facilities become scarce, and decisions must be made as to how to develop the land and utilize the resources in the most efficient manner. Various types of facility configurations are associated with different commodities. For example, containers, automobiles and roll-on/roll-off cargo require a large amount of paved, open storage space, while certain types of break bulk cargoes such as steel coil, lumber and plywood may require covered storage. Perishable commodities require temperature controlled warehouses and some dry bulk cargo requires covered storage and special dust removing equipment, while tank farms are needed to store liquid bulk cargo.

An understanding of the commodity's relative economic value in terms of employment and income to the local community, the cost of providing the facilities, and the relative demand for the different commodities is essential in making future port development plans. Because of this need for understanding relative commodity impacts, economic impacts are estimated for the following commodities handled at the Port of San Diego marine terminals:

- Containers;
- Automobiles;
- Steel;
- Lumber;
- Miscellaneous Break Bulk;

- Cement;
- Fertilizer;
- Windmill Components;
- Soda Ash;
- Petroleum.

3. MARITIME CARGO EMPLOYMENT IMPACTS

The employment generated by maritime cargo activity at the Port of San Diego marine terminals is estimated in the following section.

- First, the total employment that is in some way related to the activities at cargo terminals is estimated from the FY 2015 interview process of 156 tenants and terminal operators, as well as service providers and FY 2015 data obtained by the Port of San Diego as described in the methodology;

- Second, the subset of total employment that is judged to be totally dependent (i.e., direct jobs) on port activity is analyzed as follows:

    - The direct job impact is estimated by detailed job category, i.e., trucking, ILWU/dockworkers, steamship lines, steamship agents, chandlers, surveyors, etc;

    - The direct job impact is estimated for each of the key commodities/commodity groups;

    - The direct job impact is estimated based on the residency of those directly employed;

- Induced and indirect jobs are estimated;

- Finally, jobs related to the maritime activity at the marine terminals are described.

It is estimated that 14,753 jobs are directly or indirectly supported by activity at the Port of San Diego marine terminals. Of the 14,753 jobs:

- 1,632 jobs are directly generated by activities at the marine terminals and if such activities should cease, these jobs would be discontinued over the short term.

- 1,178 jobs (induced jobs) are supported by the local purchases of the 1,632 individuals directly

generated by port activity at the marine terminals. An additional 406 indirect jobs were supported by $55.8 million of purchases in the local and regional economy by firms providing direct cargo handling and vessel and barge services.

- 11,537 jobs are related to cargo loaded and discharged over the docks at the Port of San Diego marine terminals. These jobs are supported in the state's manufacturing and retail and wholesale and distribution industries and the in-state industries supporting the movement, processing and distribution of all commodities, primarily concentrated with containerized fruit and automobiles within the western United States.

3.1. Direct Maritime Cargo Job Impacts

In FY 2015, nearly 1.8 million tons of waterborne cargo moved via the Port of San Diego marine terminals. As a result of this activity, 1,632 full-time jobs were directly created.[6] In this section the jobs are analyzed in terms of:

- Distribution by job category;
- Distribution by commodity group; and
- Distribution by county and state of residency.

These distributions are developed in more detail below.

3.1.1. Job Impacts by Category

Exhibit II-2 presents the distribution of the 1,632 direct jobs by type of job. The exhibit indicates that the majority of direct jobs (582) are with terminal operators located at Tenth Avenue and National City marine terminals. Jobs in the surface transportation sector (510) responsible for moving cargo to and from the terminals are the second largest impact category, followed by members of the International Longshore and Warehouse Union (234).

[6] Jobs are measured in terms of full-time worker equivalents. If a worker is employed only 50 percent of the time by activity at a cargo terminal, then this worker is counted as .5 jobs.

Exhibit II-2: Cargo Employment Impacts by Sector and Job Category

IMPACT CATEGORY	DIRECT JOBS
SURFACE TRANSPORTATION	
TRUCK	465
RAIL	45
SUBTOTAL	**510**
MARITIME CARGO SERVICES	
TERMINALS	582
ILWU	234
MARITIME SERVICES/MARINE CONSTRUCTION	113
GOVERNMENT	66
FORWARDERS/CUSTOMSHOUSE BROKERS	47
TOWING/TUG ASSIST	24
AGENTS	15
PILOTS	5
SUBTOTAL	**1,087**
PORT OF SAN DIEGO MARITIME DIVISION	**35**
TOTAL	**1,632**

Totals may not add due to rounding

3.1.2. Direct Job Impacts by Commodity

The majority of the 1,632 jobs considered to be generated by port activity can be associated with the handling of specific commodities or commodity groups. It should be noted that commodity-specific impacts could not be allocated by individual commodities with any degree of accuracy for maritime construction, ship repair, or the state and Federal government due to the fact that it is difficult to estimate the percentage of resources that are dedicated to one commodity over another for these categories. For example, maritime construction may occur at a terminal that is multi-use and cannot be attributed to a specific commodity. As a result, employment in these groups (which totaled 239) was not allocated to commodity groups. Exhibit II-3 presents the relative employment impacts in terms of commodity groups.

Exhibit II-3: Distribution of Direct Cargo Job Impact by Commodity

COMMODITY	DIRECT JOBS
AUTOMOBILES	761
CONTAINERS	304
LUMBER	156
MISCELLANEOUS BREAK BULK	89
CEMENT	27
FERTILIZER	23
STEEL	15
PETROLEUM	9
WINDMILL COMPONENTS	5
SODA ASH	3
NON-ALLOCATED	239
TOTAL	**1,632**

Totals may not add due to rounding

Automobiles support the largest number of direct jobs, 761, followed by the import of containerized fruit (304 jobs), the movement of lumber (156 jobs), and then the distribution of miscellaneous break bulk and project cargo (89 jobs). The majority of the remaining direct jobs are supported by the movement of steel, cement, fertilizer, windmill components, other dry bulk and petroleum products.

3.1.3. Distribution of Direct Cargo Jobs by Place of Residence

To underscore the geographic scope of the impacts generated by the marine terminals, Exhibit II-4 presents the distribution of the 1,632 direct jobs by place of residency. The geographic employment analysis is based on the results of the interviews with firms in the maritime community. As this exhibit indicates, about nearly 98% of the direct job holders reside in San Diego County – 40.1% reside in San Diego while another 57.8% live in other parts of San Diego County.

Exhibit II-4: Distribution of Direct Cargo Jobs by Place of Residence

CITY/COUNTY	RESIDENCY PERCENT	DIRECT JOBS
SAN DIEGO COUNTY	***97.9%***	***1,597***
SAN DIEGO	40.1%	654
CHULA VISTA	29.7%	485
NATIONAL CITY	12.4%	202
EL CAJON	3.9%	63
IMPERIAL BEACH	2.7%	44
ESCONDIDO	2.7%	43
OTHER SAN DIEGO	2.1%	34
LEMON GROVE	1.0%	16
LA MESA	0.9%	15
SANTEE	0.8%	13
CARLSBAD	0.8%	13
CORONADO	0.3%	5
VISTA	0.2%	3
OCEANSIDE	0.2%	3
ENCINITAS	0.1%	2
POWAY	0.1%	2
OTHER COUNTIES	***2.1%***	***35***
TOTAL	**100.0%**	**1,632**

Totals may not add due to rounding

3.2. Induced Jobs

The 1,632 directly employed individuals received wages and salaries, a part of which was used to purchase local goods and services such as food, housing, clothing, transportation services, etc. As a result of these local purchases, 1,178 induced jobs in the regional economy were supported. The majority of the induced jobs are with local and regional private sector social services, business services, educational services and state and local government agencies, followed by jobs in the food and restaurant sector, and then jobs in the construction and home furnishings sector.

3.3. Indirect Jobs

In addition to the induced jobs generated by the purchases by directly employed individuals, the firms providing the direct services and employing the 1,632 direct jobs make local purchases for goods and services. These local purchases by the firms dependent upon the cargo facilities generate additional local jobs - indirect jobs. Based on interviews with the cargo-related firms, these firms made $55.8 million of local and in-state purchases. These direct local purchases created an additional 406 indirect jobs in the local economy.

3.4. Related User (Shipper/Consignee) Jobs

In addition to the direct, induced and indirect jobs, an estimate of jobs related to cargo moving via the Port was developed. It is estimated that 11,537 jobs with regional jobs are related to cargo moving via the Port of San Diego marine terminals. It is to be emphasized that these jobs are only related jobs, not jobs dependent upon the Port of San Diego marine terminals.

4. TOTAL ECONOMIC VALUE AND BUSINESS REVENUE IMPACTS

The total economic value of the marine cargo and vessel activity at the Port of San Diego including the revenue and value added at each stage of moving an export to the Port or an import from the marine terminals is estimated at nearly $2.0 billion. This includes the $268.8 million of direct business revenue received from businesses providing cargo and vessels services at the port and moving the cargo to and from inland destinations and origins; the $145.3 million of re-spending and local personal consumption impact; and the $1.6 billion of value of output supported by the related users. This $1.6 billion of value of output includes the revenue and value added at each stage of production, including support firms providing goods and services during the production of the export. The economic value of output with users of import cargo includes the economic value of the imported cargo moving through the seaport to final consumption either by individuals or industry. It is to be emphasized that the $1.6 billion of output with related users would not disappear from the U.S. economy should the cargo move through another port, as it is the demand for the export and import cargo that drives the value of the cargo and generates the user economic value. If the cargo were to move to another port, the logistics cost of moving the imports and exports would increase, but the value would still be generated in other regions and/or other states due to the demand for the export and import products; however, the $268.8 million of direct business revenue, and the $145.3 million of re-spending and local consumption expenditures would be lost from the local economy. The related economic value demonstrates the magnitude of influence of the Port of San Diego marine terminals at a given point of time.

4.1 Direct Business Revenue of Providing Services

The balance of the discussion focuses on the $268.8 million of direct business revenue generated from the provision of services to the cargo, vessels and barges handled at the Port of San Diego marine terminals.

Exhibit II-5 shows the distribution of this revenue impact by category and economic sector. As this exhibit indicates, the surface transportation sector receives the largest share of the total revenue impact, $114.6 million, followed by terminal and stevedoring operations that receive about $77.3 million.

Exhibit II-5: Revenue Impact by Category and Economic Sector

IMPACT CATEGORY	REVENUE ($1,000)
SURFACE TRANSPORTATION	
TRUCK	$85,069
RAIL	$29,556
SUBTOTAL	**$114,624**
MARITIME CARGO SERVICES	
TERMINALS	$77,334
MARITIME SERVICES/MARINE CONSTRUCTION	$24,067
FORWARDERS/CUSTOMSHOUSE BROKERS	$9,467
TOWING/TUG ASSIST	$6,097
PILOTS	$1,694
AGENTS	$236
GOVERNMENT	N/A
SUBTOTAL	**$118,895**
PORT OF SAN DIEGO MARITIME DIVISION	**$35,316**
TOTAL	**$268,835**

Totals may not add due to rounding

Similarly, Exhibit II-6 shows the direct revenue impact by commodity. It should again be noted that the revenue received by shippers/consignees from the sales of the products (value of the commodities) moving via the seaport terminals is not included, since product value is determined by the demand for the product, not the use of the marine terminals.

Exhibit II-6: FY 2015 Cargo Revenue Impacts by Commodity

COMMODITY	REVENUE ($1,000)
AUTOMOBILES	$113,234
CONTAINERS	$66,982
MISCELLANEOUS BREAK BULK	$10,808
CEMENT	$7,333
WINDMILL COMPONENTS	$4,254
FERTILIZER	$2,196
SODA ASH	$1,868
LUMBER	$1,174
STEEL	$1,155
PETROLEUM	$447
NON-ALLOCATED	$59,382
TOTAL	**$268,835**

Totals may not add due to rounding

As this exhibit indicates, automobiles generate the largest direct revenue impacts, followed by containerized fruit.

5. PERSONAL EARNINGS IMPACT

The income impact is estimated by multiplying the average annual earnings (excluding benefits) of each port participant, i.e., truckers, steamship agents, pilots, towing firm employees, longshoremen, warehousemen, etc., by the corresponding number of direct jobs in each category. The individual annual earnings in each category multiplied by the corresponding job impact resulted in $92.8 million in personal wage and salary earnings. It is important to emphasize that the average annual earnings of a Port-dependent job is about $56,854, compared to the state-wide average annual income of $55,260. These relatively high paying jobs will have a much greater economic impact in the local economy through stimulating induced jobs than will a job paying lower wages.

The impact of the re-spending of this direct income for local purchases is estimated using a personal earnings multiplier. The personal earnings multiplier is based on data supplied by the Bureau of Economic Analysis (BEA), Regional Input-Output Modeling System (RIMS II). The BEA estimates that for every one dollar earned by direct employees generated by activity at the marine terminals, an additional $1.56 of personal income and consumption expenditures would be created as a result of re-spending the income for purchases of goods and services produced locally. Hence, a personal earnings multiplier of 2.56 was used to estimate the total income and consumption impact of $145.3 million, inclusive of the re-spending effect. This additional re-spending of the direct income generated the 1,178

induced job impacts.

The 406 indirect job holders earned $21.4 million in indirect wages and salaries. The 11,537 related shipper/consignees of the cargo moving via the Port received about $576.5 million of personal income.

Therefore, the total personal income impact and consumption impact created by the Port of San Diego cargo activity is estimated at just over $836.0 million.

6. TAX IMPACTS

State and local tax impacts are based on per employee tax burdens which are developed at the county, local and state jurisdictional levels. These tax per employee burdens are essentially tax indices that are used to allocate total taxes at each level of government to economic activity generated by the marine terminals. To estimate the per employee tax indices, total taxes received at each governmental level in California was developed from the Tax Foundation, which reports total state and local taxes from all sources as a percent of total personal income.

Cargo activity supporting direct, induced and indirect impacts generated $29.6 million of state, county and local taxes. As a result of the economic activity created by the related shipper/consignees, an additional $65.7 million of state and local taxes were generated for a total cargo tax impact of $95.3 million. The state of California receives approximately 65% of the tax revenues, while the local governments received 35%[7] of the tax impact as illustrated in Exhibit II-7.

Exhibit II-7: Distribution of State and Local Tax Revenue

TAXES BY CATEGORY ($1,000)	STATE	LOCAL	TOTAL
DIRECT, INDUCED, & INDIRECT	$19,251	$10,332	$29,583
RELATED	$42,771	$22,955	$65,726
TOTAL	$62,021	$33,287	$95,309

Totals may not add due to rounding

[7] "State and Local Government Finances by Level of Government and by State: 2012-13," U.S. Census Bureau, *2013 Annual Surveys of State and Local Government Finances.*

III. COMPARISSON OF IMPACTS 2015 vs2012

The last economic impact study conducted for the Port of San Diego was conducted by Martin Associates in 2012, using Calendar Year 2011 cargo data. Since the last study, several structural and operational changes have occurred. With respect to the structural changes, the personal income multiplier for waterborne transportation, as estimated for the San Diego region by the U.S. Bureau of Economic Analysis, has fallen from 3.21 to 2.56. This reduction in the personal income multiplier reflects an increase in the savings rate per dollar of income earned (or conversely a decline in consumption per dollar), which has occurred since the 2008 recession. This reduction results in a lower re-spending impact and personal consumption impact per dollar of personal income, in turn reducing the induced job impact for a dollar of income earned.

Secondly, the results of a new Economic Census for 2012 were released by the U.S. Bureau of Census. In the previous study (2012), the 2007 Economic Census was used to estimate induced impacts. The jobs to sales ratios in the updated Economic Census data are smaller than those estimated in the 2007 Economic Census. The lower jobs per sales ratios, which are used to translate the local purchases by the direct employees into induced jobs, add to the decline in induced jobs resulting from the lower income multiplier. The reduced jobs to sales ratios in the Economic Census reflect both an increase in overall productivity in the U.S., as well as the jobless recovery from the recession of 2008 and 2009. As is well documented in economic literature, more jobs have been filled with part time employees and some jobs have not been refilled.[8] As a result of these structural shifts, the induced job impacts per dollar of income are lower in this most recent study compared to the 2012 economic impacts.

From an operational perspective, total tonnage handled at Port of San Diego marine terminals grew by about 0.4 million tons. The overall growth in tonnage was driven by automobiles handled at National City marine terminal, followed by containerized tonnage handled at Tenth Avenue marine terminal. Exhibit III-1 presents the changes in tonnages between CY 2011 and FY 2015.

8. www.economist.com/blogs/freeexchange/2012/08/americas-jobless-recovery

Exhibit III-1: Change in Tonnage by Commodity, CY 2011-FY 2015

COMMODITY	FY 2015 (1,000 TONS)	CY 2011 (1,000 TONS)	CHANGE (1,000 TONS)
AUTOMOBILES	650	359	291
CONTAINERS	717	619	98
MISCELLANEOUS BREAK BULK	107	92	15
STEEL	13	4	9
FERTILIZER	50	43	7
SODA ASH	50	45	5
PETROLEUM	72	91	-19
WINDMILL COMPONENTS	0.627	38	-37
TOTAL	**1659**	**1291**	**368**

Excludes tonnage not moving via water / Totals may not add due to rounding

As a result of the growth in cargo, the dependent direct, induced, and indirect jobs increased by 537. When the non-dependent, related jobs are included, total jobs increased by more than 3,700 jobs. The Port of San Diego saw a loss of tonnage in windmill components and petroleum products used for bunkering vessels throughout the San Diego Bay. Exhibit III-2 shows the change in impacts between CY 2011 and FY 2015.

Exhibit III-2: Change in Economic Impacts, CY 2011 – FY 2015

	FY 2015	CY 2011	CHANGE
JOBS			
DIRECT	1,632	1,210	422
INDUCED	1,178	1,152	26
INDIRECT	406	317	89
TOTAL	3,216	2,679	537
PERSONAL INCOME/LOCAL CONSUMPTION ($1,000)			
DIRECT	$92,786	$66,948	$25,838
RE-SPENDING/LOCAL CONSUMPTION	$145,321	$148,304	-$2,983
INDIRECT	$21,391	$16,726	$4,665
TOTAL	$259,498	$231,978	$27,520
BUSINESS REVENUE ($1,000)	$268,835	$210,210	$58,625
STATE AND LOCAL TAXES ($1,000)	$29,583	$25,982	$3,601
LOCAL PURCHASES ($1,000)	$55,802	$43,634	$12,168
RELATED USER IMPACTS			
USER JOBS	11,537	8,286	3,251
TOTAL VALUE OF OUTPUT ($1,000)	$1,580,164	$957,521	$622,643
USER INCOME ($1,000)	$576,546	$281,447	$295,099
USER STATE/LOCAL TAXES ($1,000)	$65,726	$31,522	$34,204

Totals may not add due to rounding

Direct jobs increased by 422 jobs since CY 2011 and indirect jobs grew by 89, reflecting the increase of $12.2 million of local purchases. Direct, induced, and indirect state and local taxes generated by port activity grew by $3.6 million while directly dependent business revenue grew by $58.6 million. This includes the revenue received from providing services to the vessels and cargo handled at the Port of San Diego marine terminals. Total economic value of the Port of San Diego cargo activity increased from $1.3 billion in CY 2011 to nearly $2.0 billion in FY 2015, while total jobs that are in some way related to the Port grew by 3,789 jobs. The total value of economic activity includes the direct revenue generated by the cargo terminals, the re-spending impact of personal income and local consumption, and the value of output of the related shippers/consignees using the Port.

The change in direct jobs by type of job is shown in Exhibit III-3. As shown in this exhibit, the largest gain occurred in the terminal employees. The primary driver of this increase is the number of

autos moving via the Port and associated processing jobs. The increase in surface transportation jobs is driven by an increase in total tonnage being shipped to and from inland destinations by truck and rail. The loss of government jobs is driven by a loss of billets in the United State Coast Guard between CY 2011 and FY 2015. The loss of billets is Coast Guard wide and not unique to San Diego. Towing jobs decreased between CY 2011 and FY 2015 reflecting the loss of lumber moving via barge. Lumber is currently being railed from the Pacific Northwest to San Diego and distributed locally by truck.

Exhibit III-3: Change in Direct Jobs by Job Category, CY 2011-FY 2015

IMPACT CATEGORY	FY 2015	CY 2011	CHANGE
SURFACE TRANSPORTATION			
TRUCK	465	303	162
RAIL	45	30	16
SUBTOTAL	**510**	**333**	**178**
MARITIME CARGO SERVICES			
TERMINALS	582	325	257
ILWU	234	221	13
MARITIME SERVICES/MARINE CONSTRUCTION	113	104	9
GOVERNMENT	66	90	-24
FORWARDERS/CUSTOMSHOUSE BROKERS	47	50	-3
TOWING/TUG ASSIST	24	32	-8
AGENTS	15	14	2
PILOTS	5	5	0
SUBTOTAL	**1,087**	**841**	**246**
PORT OF SAN DIEGO MARITIME DIVISION	**35**	**37**	**-2**
TOTAL	**1,632**	**1,210**	**422**

Totals may not add due to rounding

In summary, between CY 2011 and FY 2015, the Port of San Diego marine terminals experienced a strong growth in cargo tonnage, adding nearly 0.4 million tons of cargo. The growth in cargo fueled the growth in 422 direct jobs at the Port of San Diego marine terminals.

The fact that the Port of San Diego continues to increase its importance in the local economy as a major source of job creation, particularly of jobs with an average annual salary of $56,854, underscores the importance of the Port as a major catalyst in San Diego County and the state of California economies. In order to sustain this growth as an economic engine, it is critical that the Port continues to invest in terminal, rail and highway access infrastructure to meet future demand, and to continue to attract tenants to stimulate further economic development in Southern California. This suggests that the future growth of the Port will result in further job, income and tax growth for the region.